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COMMERCIAL FISHERIES REVIEW

A review of developments and news of the fishery industries prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor
H. M. Bearse, Assistant Editor

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COVER: In the foreground is the tuna cannery of a large Terminal Island, Calif., fish-packing firm. Considered the world's largest fish cannery, it has a daily capacity of 15,000 standard cases of 48 halves on an eight-hour shift. The two unloading docks in the foreground on the right can accommodate 4 large tuna vessels at one time. Thawing tables can be seen at the cannery end of the unloading docks. The cannery employs 800 and has 8 packing lines. Daily unloading capacity is about 700,000 pounds or 350 tons of raw tuna.

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PROCESSING AND QUALITY STUDIES OF SHRIMP HELD IN REFRIGERATED SEA WATER AND ICE

Part 2 - Comparison of Objective Methods for Quality Evaluation of Raw Shrimp

By Jeff Collins,* Harry Seagran,* and John Iverson**

ABSTRACT

A report on the suitability of certain objective tests as quality indices for raw shrimp held in refrigerated sea water and in ice.

BACKGROUND

The technical literature indicates that a refrigerated sea-water system has several potential advantages over an icing system. In the first study reported in the present series on the possible use of refrigerated sea-water with Alaska shrimp (Collins 1959), it was found that pink shrimp machine peeled satisfactorily after being held in refrigerated sea-water and yielded a product of satisfactory quality. Before the relative usefulness of refrigerated sea-water could be evaluated, however, data were needed on how the quality of the shrimp is affected by holding and processing variables.

Fig. 1 - An Alaska shrimp boat showing the beam trawl on deck.

For this work, objective methods of assessing quality were necessary. Many objective tests--such as total volatile base, total volatile acid, trimethylamine, and so on--have been proposed, each one of which gives certain information. The purpose of the present work was to find which of these various tests is the most suitable for the objective evaluation of the quality changes of shrimp held in refrigerated sea-water as well as in ice.

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EXPERIMENTAL

The general experimental approach was (1) to hold shrimp for a period of time in refrigerated sea-water and in ice, (2) to make measurements at intervals of time by various objective tests and by a subjective test as well, and (3) to determine which of the objective tests yielded the most information in the light of the findings of the subjective test. Details of the experiment follow.

MATERIAL: About 120 pounds of whole fresh pink shrimp (Pandalus species) were obtained from Wrangell, Alaska. The shrimp were landed within a few hours of capture, iced overnight, and shipped via air to the laboratory on the following morning. The shrimp were then briefly rinsed in cold fresh water and allowed to drain for a few minutes.

HOLDING METHODS: Iced: The drained shrimp were mixed with crushed ice (about 2 to 1, ice to shrimp ratio), placed in an insulated ice chest in perforated containers, and held up to 10 days. The shrimp were re-iced daily.

Fig. 2 - Gathering the beam-trawl net prior to brailing the catch.

Refrigerated Sea Water--"Closed": The whole drained shrimp were held by the normal refrigerated sea-water method (Collins 1959) except that the shrimp were held in this time series up to 8 days in a closed system. That is, 1.5 kg. (2.2 pounds) of shrimp and 1.5 kg. (2.2 pounds) of brine were placed in No. 10 (C-enamel) cans, seamed, and then submerged and held in the refrigerated sea-water tank. The cans were essentially filled.

Refrigerated Sea Water--"Open": A stainless-steel kettle containing the shrimp and brine was suspended in the refrigerated sea-water tank. Circulation of the brine in the kettle was obtained by use of an external centrifugal pump. In this "open" system, the only deviation from the normal refrigerated sea-water system was that of temperature. The temperature varied between 31° and 35° F. (rather than the normal 29°-31° F.).

The purpose in maintaining comparative samples in "closed" and "open" systems was to determine what effects (if any) the limitation of oxygen would have on the results of the tests employed. It is recognized that at least initially the closed system is not anaerobic. During storage, it is likely that such a system becomes less aerobic, and as a result, the over-all spoilage products may include products of anaerobic processes. If the results of the tests employed do not reflect a difference between systems, the closed system would be employed in subsequent series on refrigerated sea-water-holding variables, since more exact control of experimental conditions are possible.

PREPARATION OF SAMPLES FOR ANALYSIS: At selected intervals during this time series, as well as for a control, about 1.5 kilograms (3.3 pounds) of the whole shrimp, for each of the methods of holding, was quickly peeled by hand. The unwashed meats were homogenized in an electric blender, vacuum-seamed in ½-pound, flat, C-enamel cans, and held in a plate freezer at -20° F.

ANALYTICAL METHODS: The following analyses were carried out on these samples: total nitrogen, oil, total solids, ash, total chloride (Association of Official Agricultural Chemists 1955), total volatile base (Stansby, Harrison, Dassow, and Sater 1944), total volatile acid (Friedemann and Brook 1938), trimethylamine (Dyer 1945), amino nitrogen (Pope and Stevens 1939), and glycogen (Van Der Kleij 1951). Nonprotein nitrogen was obtained by extracting the homogenized meat three times with 5-percent trichloroacetic acid and determining the total nitrogen content (AOAC 1955) of the centrifuged and filtered extract. A glass electrode was used to determine the pH of a 2-to-1 mixture of distilled water and homogenized meat. In addition to these objective tests, the whole, raw, cold shrimp at each time interval were subjectively judged for odor prior to being peeled.

RESULTS AND DISCUSSIONS

The analytical data obtained using these objective tests on the shrimp held in ice or in refrigerated sea-water are given in table 1.

Table 1 - Analytical Data on Pink Shrimp Held in Ice and Refrigerated Sea-Water (RSW) Using Various Objective Quality Assessment Methods

Holding Method	Time	Nitrogen			Total Volatile Base	Total Volatile Acid	Trimethyl-amine	Oil	Total Solids	Ash	Total Chloride	Corrected Ash (ash-NaCl)	Glycogen	pH
		Total	Nonprotein	Amino										
	Days	(Percent)			Mg. N/100g.	Meq. H^+/100g.	Mg.TMA-N/100g.	(Percent)			As %NaCl	(Percent)		
Control Ice	0	3.008	0.800	0.333	5.56	0.107	0.24	1.08	20.50	1.46	0.48	0.98	0.026	6.15
"	1	2.781	0.703	0.279	5.82	0.115	0.40	1.06	18.32	1.27	0.51	0.76	0.027	7.68
"	2	2.578	0.590	0.222	6.01	0.115	0.20	1.14	16.96	1.02	0.30	0.72	0.032	7.83
"	3	2.300	0.442	0.161	6.14	0.163	0.52	1.06	15.35	0.82	0.18	0.64	0.028	8.10
"	4	2.318	0.446	0.175	7.12	0.186	0.92	1.08	15.27	0.89	0.20	0.69	0.031	8.40
"	5	2.239	0.387	0.140	7.57	0.218	0.52	1.08	14.82	0.87	0.15	0.72	0.028	8.24
"	6	1.992	0.303	0.108	6.66	0.236	1.72	1.12	13.76	0.79	0.10	0.69	0.023	8.25
"	8	2.014	0.251	0.082	7.89	0.226	1.72	1.07	13.55	0.62	0.09	0.53	0.021	8.35
"	10	1.921	0.240	0.060	9.58	0.262	2.92	1.08	12.85	0.55	0.04	0.51	0.020	8.29
RSW (open)	1	2.568	0.514	0.190	4.60	0.069	0.28	0.94	16.67	2.00	1.42	0.58	0.026	7.98
"	2	2.279	0.478	0.143	5.05	0.178	0.52	0.94	16.24	2.23	1.58	0.65	0.029	8.20
"	3	2.098	0.429	0.140	6.31	0.200	0.76	0.94	15.49	2.08	1.63	0.45	-	8.20
"	4	2.058	0.390	0.133	9.35	0.360	1.44	0.92	14.83	2.34	1.65	0.69	0.028	8.44
"	5	1.982	0.409	0.140	25.64	0.740	26.88	0.92	14.80	2.38	1.65	0.73	0.024	8.35
"	6	2.042	0.437	0.165	42.63	1.13	46.40	0.94	15.06	2.31	1.62	0.69	0.023	8.20
"	8	2.023	0.479	0.150	59.67	1.86	61.86	0.94	14.85	2.31	1.65	0.66	0.023	8.43
RSW (closed)	1	2.562	0.584	0.227	4.63	0.061	0.40	1.06	18.18	1.91	1.17	0.74	0.024	7.70
"	2	2.460	0.532	0.187	5.15	0.117	0.20	0.86	17.06	2.02	1.48	0.53	0.033	7.95
"	3	2.295	0.428	0.165	4.88	0.177	0.92	0.96	16.59	2.28	1.51	0.77	0.031	8.06
"	4	2.214	0.450	0.157	6.95	0.315	1.72	1.12	16.53	2.31	1.51	0.80	0.032	8.33
"	5	2.160	0.455	0.160	13.53	0.356	9.60	1.04	16.19	2.32	1.60	0.72	0.029	8.25
"	6	2.173	0.457	0.149	27.42	0.606	28.80	0.92	15.71	2.31	1.59	0.72	0.029	8.32
"	8	2.100	0.478	0.166	47.86	1.40	55.20	1.02	15.68	2.37	1.60	0.77	0.027	8.35

The samples that had been held in ice were noted as being completely fresh for 5 days, as being somewhat stale on the 6th day, as possessing a very slight off-odor on the 8th and 10th day, and as being definitely spoiled by the 13th day. The limit of acceptability could probably be set at about the 7th day. The long acceptability period of the shrimp held in ice in this experiment was undoubtedly due to the very thorough icing condition employed.

By the subjective test, the samples held in refrigerated sea water were considered to be fresh at the time of examination on the 4th day of storage. Sometime thereafter, between the 4th and 5th day, the compressor of the refrigerated sea-water unit malfunctioned, causing a significant rise in temperature for a period of several hours. As a result, on the 5th day, shrimp in both of the refrigerated sea-water systems had a definite spoilage odor.

A direct comparison of the ice-held and refrigerated sea-water-held shrimp was not possible because of the malfunction. However, certain of the objective quality tests picked up this malfunction, whereas others did not. Of the various objective spoilage tests, only volatile base, volatile acid, and trimethylamine values correlated well with the subjective ratings or picked up the malfunction. Trimethylamine seemed particularly good as a spoilage test for all samples. The pH values indicated a slight upward trend over the storage period but were of insufficient magnitude to be of any value as a spoilage test. Glycogen values showed a slight

upward trend to a maximum after about 2 days and then a very gradual drift back down to about the initial value.

In fresh pink shrimp, about 25 percent of the total nitrogen is nonprotein nitrogen and about 40 percent of this nonprotein nitrogen is alpha amino nitrogen (free amino acids). All three nitrogen fractions (total, nonprotein, and amino) decreased in the shrimp during the holding period in ice. The continuous washing action of melting ice is thought to cause a true leaching of the initial nonprotein nitrogen and a further leaching of this material as it is formed through enzymatic hydrolysis of protein. For the shrimp held in refrigerated sea-water, the total nitrogen also decreased, but at a slower rate than did that of the shrimp held in ice. The nonprotein and amino nitrogen fractions decreased to a minimum at the 4th day and then slowly increased for the remainder of the holding time. It appears that in the refrigerated sea-water system, a condition exists such that after the initial leaching period (to the 4th day here), the total nonprotein nitrogen accumulates through enzymatic hydrolysis of protein at a faster rate than it is utilized by bacteria.

Total solids and corrected ash[1/] tended to decrease over the holding period, whereas oil showed little change. The salt uptake of the shrimp in the refrigerated sea-water system was rapid, equilibrium being reached within 3 days.

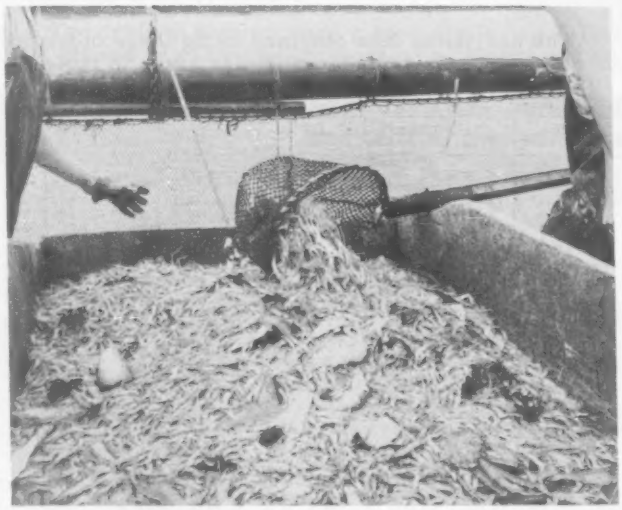

Fig. 3 - Brailing the catch from the beam trawl.

With respect to the refrigerated sea-water systems employed in this study, it was observed that the odors for the shrimp held in the "open" system were slightly different from the odors of those held in the "closed" system, and the shrimp held in the open system spoiled at a faster rate than did those held in the closed system. Although it is recognized that there are certain differences in aerobic and anaerobic spoilage which may account for the slight differences in odor noted, it was concluded that the different rates of spoilage, as determined by the objective tests, were caused by the differences in temperatures between the two systems. The objective tests appeared to apply equally well to the detection of spoilage in either system and to the detection of that in ice.

SUMMARY AND CONCLUSIONS

The purpose of this study was to determine which of 13 objective tests would adequately serve as spoilage indices and provide for general characterization of shrimp held in refrigerated sea-water and in ice. In addition, information was required on any differences which might arise between the quality of shrimp held in a "closed" or "open" refrigerated sea-water system.

From the data obtained, the following objective tests were concluded to be suitable: (1) trimethylamine and volatile acids, as indices of bacterial spoilage; (2)

1/Corrected ash: total ash minus NaCl.

amino nitrogen, non-protein nitrogen, and total nitrogen, as indices of enzymatic action; and (3) total solids and total chloride, for general characterization. The "closed" system will be used in subsequent studies, since no differences were found by the methods employed in this study between shrimp held in the two refrigerated sea-water systems (except those caused by temperature differences).

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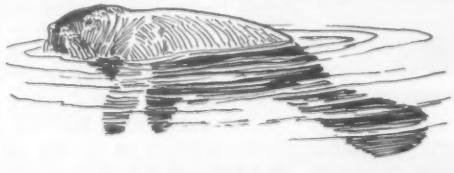
MANATEE FOR AQUATIC VEGETATION CONTROL?

The Food and Agricultural Organization of the United Nations and the Indo-Pacific Fisheries Council are exploring the possibility of introducing manatees (sea cows) into Ceylon and Thailand to control aquatic vegetation. In the United States manatees are most abundant in Florida waters, though their range is said to cover much of the Gulf of Mexico coast; they occur also on the northern coast of South America. Unfortunately, little is known of their age at maturity, maximum size, longevity, and tolerances for temperature variations and transportation over long distances. If successful, this would be true biological control of aquatic weeds, a problem in many parts of the world.



SHRIMP-WASTE MEAL: EFFECT OF STORAGE VARIABLES ON PIGMENT CONTENT

J. E. Rousseau, Jr.*

ABSTRACT

One of the potential uses of shrimp-waste meal is as a supplement in the ration of hatchery-raised trout. The astaxanthin present in the meal gives trout a desirable color. This paper reports (1) a study of a method of analysis of the pigment and (2) the effect of storage variables on pigment losses and the development of oxidative rancidity. The benefits to be derived from addition of antioxidants were investigated.

INTRODUCTION

Astaxanthin, a carotenoid pigment present in certain insects and crustacea, has been identified as being one of the principal dietary pigments causing coloration in trout (Goodwin 1954). Hatchery-raised trout usually lack this natural and desirable coloration unless a source of the pigment--for example, salmon eggs or shrimp--is included in the diet. The use of such supplements in production-type rations, however, has not been a common practice because of limited supply or prohibitive cost. Recent feeding tests now have shown that meal prepared from Alaska shrimp waste also would impart a natural coloration to young rainbow trout (Sinnhuber 1955[1/]). This finding indicated a potential outlet in trout-hatchery feeds for the considerable amount of waste being discarded annually by the Alaska shrimp industry.

Fig. 1 - Spectrophotometric determination of astaxanthin in Alaska shrimp-waste meal.

Astaxanthin, in common with other carotenoids, is destroyed readily by heat, air, and light. The pigment thus may become a limiting factor in the value of meal when used for the purpose of coloring trout. There is consequently a need for information as to the effect of storage variables on the destruction of the pigment. A problem exists also in the analytical determination of the astaxanthin.

The purposes of the work reported here therefore were as follows:

1. To study the method of analysis of the pigment.

2. To determine the effect of storage on loss of the pigment and the development of oxidative rancidity in Alaska shrimp-waste meal, which has a relatively high oil content (Brown 1959), and to compare concurrently the effectiveness of antioxidants in retarding these changes.

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1/R. O. Sinnhuber, Food Technology Department, Oregon State College, Corvallis, Oregon. Unpublished observations.

METHOD OF PIGMENT ANALYSIS

The primary interest in the work reported in the present paper was the effect of storage on the pigment in Alaska shrimp-waste meal. As often happens in studies of this kind, however, a suitable method of analysis must be available before the principle objectives can be attained. The procedure used in the analysis of the pigment is described, and the suitability of the procedure is discussed.

PROCEDURE: The pigment in shrimp-waste meal is determined as follows:

1. Place an accurately weighed sample of shrimp-waste meal of about 2.5 grams in a 100-milliliter centrifuge tube.

2. Add 50 milliliters of acetone. (Baker's analyzed reagent was used in the present work.)

3. Shake the tube mechanically for 15 minutes.

4. Centrifuge the resulting mixture at about 650 times gravity for 5 minutes.

5. Dilute an aliquot suitably for spectrophotometric absorption measurement.

6. Pipette a sample into a 1-centimeter silica absorption cell.

7. Determine the absorption of the acetone extract at a wavelength of 470 milimicrons. (A Model DU Beckman spectrophotometer was used.)

8. Express the absorbency of a 100-milliliter acetone extract of 5 grams of the meal as the pigment index, $E_{1\ cm}^{5\%}$.

SUITABILITY: The simple procedure for acetone extraction and spectrophotometric analysis just described is not specific for astaxanthin, since other pigments absorbing in the region of 470 millimicrons also will contribute to the total absorption and be measured as astaxanthin. One of the oxidation products of astaxanthin is another carotenoid, astacin, for example, which has a similar absorption spectrum but which has been shown to be ineffective in producing color when included in the diet of hatchery trout (Goodwin 1954). Tests therefore were carried out to obtain evidence for the identity of the pigment in shrimp-waste meal and, in addition, to estimate what percentage of the pigments extracted by acetone was made up of astaxanthin. In this way the applicability of the simple extraction procedure to the analysis of astaxanthin in shrimp-waste meal could be evaluated.

Procedure: To identify the pigment in shrimp-waste meal, we followed essentially the methods of Goodwin and Srisukh (1949). These methods consisted of a phasic analysis by partitioning the pigment between 90 percent (V/V) aqueous methanol and petroleum ether (b.p. 30° to 60° C.), separation of the pigments on alumina, and determination of the absorption spectra of the chromatographed solutions in carbon disulfide.

Results and Discussion: The pigment was found to be mainly epiphasic a property of astaxanthin when partitioned between 90 percent (V/V) aqueous methanol and petroleum ether (b.p. 30° to 60° C.). Astacin, an artifact of astaxanthin, is hypophasic between these solvents. Chromatography of the pigment in petroleum ether solution on alumina (Merck, acid washed, for chromatography) indicated that the pigment was esterified astaxanthin, since it was eluted readily with 5 percent (V/V) acetone-petroleum ether. A more polar solvent, 2 percent (V/V) glacial acetic acid-ethanol, was required to elute free astaxanthin from alumina (Goodwin and Srisukh 1949). Astacin, which is more strongly absorbed, would not be expected to be eluted

under either of the aforementioned conditions (Goodwin and Srisukh 1949). A decrease in absorbency after chromatography indicated that the astaxanthin fraction constituted approximately 75 percent of the pigment of the unchromatographed extract. The simple acetone-extraction procedure therefore overestimates the astaxanthin content of shrimp-waste meal.

Absorption spectra of the chromatographed extracts exhibited one absorption maximum at a wavelength of 502 millimicrons in carbon disulfide. This compared favorably with the reported absorption maximum for esterified astaxanthin, namely, 503 millimicrons. The absorption maximum for astacin is 510 millimicrons in carbon disulfide (Goodwin and Srisukh 1949). Attempts to obtain additional evidence for the identity of the pigment by means of color tests (Karrer and Jucker 1950) were unsuccessful.

Pigment from shrimp-waste meal that had been heated over an extended period exhibited absorption at 470 millimicrons; the spectra departed, however, from the characteristic spectrum of astaxanthin in this solvent. Although these meals would have a low pigment content, the analyses could be misleading. Consequently, the development of chromatographic techniques for routine analysis would be desirable. The development of such a method would probably take considerable time, so the simple acetone-extraction procedure was adopted to follow the changes in pigment content of the meals.

STORAGE TESTS

Three experiments were run that had as their objective the determination of the following:

1. Level of antioxidants needed for retention of pigment.

2. Effect of antioxidants and a synergist on pigment retention and retardation of oxidative rancidity.

3. Effect of antioxidants in meals of different moisture content.

Shrimp-waste meals used in these experiments were dried in a forced-convection oven. Fresh, unground shrimp waste was placed on shallow trays and dried for 6 hours at 65° to 75° C. (149°-167° F.). The dried material was ground in a Hobart grinder.

DETERMINATION OF EFFECTIVE LEVELS OF ANTIOXIDANTS FOR PIGMENT RETENTION: Procedure: Samples of shrimp-waste meal weighing 10 grams were treated with either BHT (2,6-ditertiarybutyl-4-hydroxytoluene) or Santioquin (6-ethoxy-2,2,4-trimethyl-1,2-dihydroquinoline) at levels of 0, 0.02, 0.08, 0.32, and 0.64 percent in the meal. This was accomplished by spraying and blending into the meal acetone solutions containing the respective concentration of the antioxidant. The latter samples were transferred to shallow dishes and placed in a current of air for 1 hour to evaporate the acetone. The samples then were placed in an oven maintained at 50° C. (122° F.) and analyzed initially and at weekly intervals for content of pigment.

Table 1 - Effect of Level of Antioxidant on Pigment Retention in Shrimp-Waste Meal at 50° C. (122° F.)

Antioxidant	Level	Retention of Pigment at End of:			
		168 Hrs.	336 Hrs.	672 Hrs.	696 Hrs.
		(Percent)			
BHT	0	77	56	-1/	-1/
	0.02	75	56	21	-
	0.08	77	58	26	-
	0.32	76	58	30	-
	0.64	81	61	27	-
Santoquin	0	78	64	-1/	38
	0.02	92	80	-	52
	0.08	94	86	-	62
	0.32	95	89	-	71
	0.64	95	90	-	76

1/Not determined.

Results: Results of the test are given in table 1. Santoquin was

effective in retarding pigment losses, whereas BHT-treated samples were similar to controls. The effectiveness of Santoquin appeared to increase with increasing levels of antioxidant in the meal. These results paralleled, in part, previous work on the protection of carotene in alfalfa (Thompson 1950). In the latter study, however, BHT exhibited some antioxidant activity.

EFFECT OF ANTIOXIDANTS AND A SYNERGIST ON PIGMENT RETENTION AND THE RETARDATION OF OXIDATIVE RANCIDITY IN SHRIMP-WASTE MEAL: Procedure: Samples of meal were treated, as before, with acetone solutions of BHT, Santoquin and citric acid, singly and in combinations, to give a level of 0.02 percent each in the meal. Storage tests were conducted at 60° C. (140° F.). Two ovens were used in order to separate samples that contained Santoquin. (Preliminary studies had indicated that when controls and samples treated with Santoquin are placed in the same oven, an antioxidant effect is observed in the untreated controls.) Samples were taken initially and at weekly intervals for pigment analyses and reaction with 2-thiobarbituric acid (TBA), the reaction with TBA to serve as a measure of oxidative rancidity (Yu and Sinnhuber 1957 and Ryan and Stansby 1959).

Table 2 - Retention of Pigment in Shrimp-Waste Meal After Storage at 60° C. (140° F.)

Antioxidant Added at the 0.02-Percent Level in the Meal			Amount of Pigment Retained After		
BHT	Citric Acid	Santoquin	1 Week	2 Weeks	3 Weeks
			(Percent)		
0	0	0	59	29	19
+	0	0	63	33	23
0	+	0	54	30	21
+	+	0	62	31	21
0	0	+	78	61	49
0	+	+	82	64	50
+	0	+	80	59	48
+	+	+	78	60	48

Results: Results of these tests are given in table 2. Only those samples that contained Santoquin exhibited a decrease in the rate of destruction of pigment. In addition, Santoquin, but not BHT, was effective in limiting oxidative rancidity (table 3). Since BHT is reportedly an effective fat antioxidant, these results were not expected. A probable explanation for the ineffectiveness of BHT was suggested by the report (Anonymous 1957) that BHT tends to steam distill at elevated temperatures.

Table 3 - 2-Thiobarbituric Acid Reaction (TBA) of Shrimp-Waste Meal During Storage at 60° C. (140° F.)

Antioxidant Added at the 0.02-Percent Level in the Meal			TBA Color ($E^{1\%}_{1\ cm.}$)						
BHT	Citric Acid	Santoquin	1 Week	2 Weeks	3 Weeks	4 Weeks	5 Weeks	6 Weeks	7 Weeks
0	0	0	0.405	0.475	0.562	0.636	0.671	0.730	0.762
+	0	0	0.373	0.449	0.546	0.634	0.690	0.703	0.765
0	+	0	0.406	0.486	0.560	0.620	0.697	0.708	0.765
+	+	0	0.404	0.464	0.547	0.632	0.698	0.732	0.758
0	0	+	0.357	0.341	0.399	0.472	0.487	0.548	0.571
0	+	+	0.338	0.362	0.404	0.446	0.530	0.529	0.527
+	0	+	0.328	0.363	0.409	0.532	0.542	0.592	0.594
+	+	+	0.332	0.381	0.408	0.476	0.542	0.579	0.589

EFFECT OF ANTIOXIDANTS AT DIFFERENT MOISTURE LEVELS IN MEALS: A third test was therefore carried out using closed containers and a lower temperature, and included the effect of level of moisture in the meals.

Procedure: Shrimp-waste meals containing 4-percent and 10-percent moisture were treated with either BHT or Santoquin at 0.02-percent level. Samples weighing 20 grams were placed in closed 8-ounce jars and held at 38° C. (100.4° F.). Samples were taken initially and at weekly intervals for pigment and TBA analyses.

Table 4 - Percentage Retention of Pigments in Shrimp-Waste Meals of Different Moisture Contents During Storage at 38° C. (100.4° F.)

Antioxidant	Moisture Content	Retention of Pigment		
		1 Week	2 Weeks	3 Weeks
		(Percent)		
None	4	92	88	81
Santoquin	4	96	89	88
BHT	4	91	84	83
None	10	56	39	36
Santoquin	10	79	69	66
BHT	10	64	48	43

Results: Results are given in tables 4 and 5. The samples containing 4-percent moisture exhibited lower rates of pigment

loss and less color development in the TBA reaction. The samples containing 10-percent moisture exhibited more rapid rates of decrease in pigment and a marked initial increase in TBA color. After 8 weeks, absorption spectra of the acetone extracts of the meals were obtained. The pigment content of the control and BHT treated 10-percent moisture samples had decreased considerably, and in addition, the spectra in acetone solution were not characteristic of astaxanthin; thus absorbency at 470 millimicrons as an index of astaxanthin content could be misinterpreted. Since extensive destruction of pigment in the controls and BHT-treated samples had occurred at the end of 8 weeks, such meals would be identified visually as nontypical. It nevertheless would appear desirable to employ chromatographic analysis that would allow both a qualitative and quantitative evaluation of the pigment in shrimp-waste meal.

Table 5 - 2-Thiobarbituric Acid (TBA) Reaction for Shrimp-Waste Meal of Different Moisture Contents During Storage at 38° C. (100.4° F.)

Antioxidant	Moisture Content	TBA Color ($E^{1\%}_{1\ cm.}$)			
		0 Week	1 Week	2 Weeks	3 Weeks
	Percent				
None . . .	4	0.289	0.284	0.321	0.324
Santoquin .	4	0.311	0.267	0.335	0.286
BHT	4	0.311	0.313	0.326	0.312
None . . .	10	0.419	0.694	0.812	0.806
Santoquin .	10	0.419	0.504	0.622	0.614
BHT . . .	10	0.439	0.657	0.760	0.772

SUMMARY

Details of a method of analysis sufficiently accurate for the present immediate purposes are given, and evidence that the pigment in Alaska shrimp-waste meal is mainly esterified astaxanthin is presented.

Santoquin, but not BHT, was effective in decreasing both the rate of pigment destruction and the development of oxidative rancidity, the latter as measured by the 2-thiobarbituric acid reaction. Citric acid exhibited no synergistic effect with either Santoquin or BHT under the conditions of this study.

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NEW TECHNOLOGICAL LABORATORY FOR FISHERIES RESEARCH IN GLOUCESTER, MASSACHUSETTS

To meet the needs of the New England fishing industry and to form a center for long-range technological investigations of our marine resources, the U. S. Bureau of Commercial Fisheries opened a new Technological Laboratory in Gloucester, Mass., towards the latter part of 1959.

Back in 1945 a senior technologist was assigned to the New England area to find out what the fishing industry needed in the way of technological research. The result of his study was the establishment of a small laboratory on the Boston waterfront which directed the efforts of a few professional people to the development of a satisfactory method of freezing fish at sea.

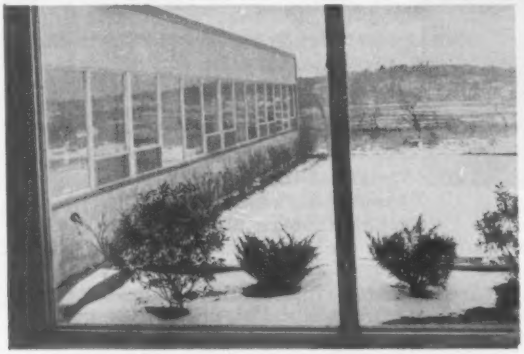


Fig. 1 - View of the office wing from the reception hall of the Gloucester Laboratory.

From this small beginning there was shaped the present staff of 14 professionals trained in chemistry, biochemistry, engineering, fishery technology, and related fields. This seasoned team has recently moved from the ramshackle building that housed the laboratory in East Boston to the new quarters in Gloucester.

The entire laboratory program is oriented toward providing the knowledge necessary for industry to attain its goal of producing fishery products of a quality as close to that of the freshly-caught fish as is possible. To accomplish this, the technological research program is divided into three major work areas dealing with: (1) the development of standards and specifications for fishery products, (2) preservation and engineering studies both on the vessel and ashore, and (3) chemical studies on the composition of fish and fishery byproducts, proteins, and flavors and odors.

Fig. 2 - Library section at the new laboratory.

A team of four chemists and a fishery aid are concentrating on the development of U. S. Standards for Grades and the preparation of Federal Specifications for fishery products. Surveys of current industry production practices and analyses of products form the basis for the development of standards for quality characteristics and effective testing methods. The resulting standards serve as a quality gauge in wholesale buying and selling and assurance to the consumer of an attractive high-grade product. Regular meetings with members of industry at various stages of this program's development have provided opportunity for partnership in the discussions and evaluation of standards as they are prepared.

The Federal Specifications which are developed under this program also assist industry and military and civil agencies by standardizing Federal purchases. This allows industry to compete for contracts on an even and fair basis, and at the same time assures Federal consumers of good quality fish at competitive market prices.

Fig. 3 - The conference room overlooking the Annisquam River.

Recognizing that improved quality results in increased sales and improved handling in decreased costs, the Preservation and Engineering group is working to improve the quality of fishery products through all phases of handling--from the time the fish is caught until the finished product reaches the consumer. At the present time preservation studies are being conducted on the time-temperature tolerance of frozen fishery products and on new methods of chilling and freezing fish at sea and ashore. The time-temperature-tolerance project is concerned with investigations of the effects of various combinations of temperature, storage time, relative humidity in the storage room, and other factors experienced during distribution on the quality of fishery products. In addition, frozen-storage studies are being conducted on new products from presently underutilized species of fish as a means of establishing new markets for such products. This group is also investigating methods of chilling groundfish in refrigerated sea water as a possible method for extending the edible shelf life of these fish, to provide more efficient handling, and to level out production.

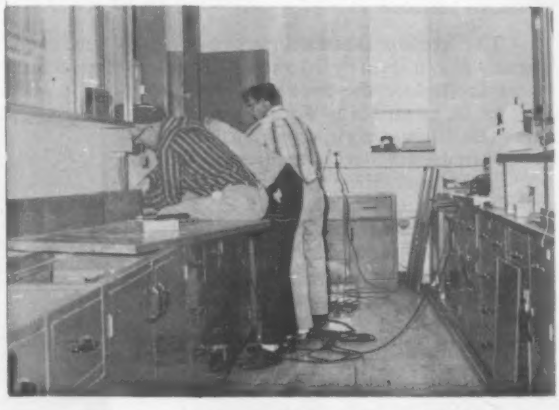


Fig. 4 - Installation of furniture in the organic chemistry laboratory.

Engineering projects at the laboratory include the design of pilot-model refrigerated seawater installations for use at the processing plant or aboard a fishing vessel, studies on the freezing of fishery products, and on methods of improving plant and vessel sanitation. These investigations are designed to provide information that will better the economic position of both vessel and plant operators.

Chemical investigations into the fundamental quality factors of fishery products are the responsibility of the composition and utilization group. Problems under investigation include the composition of fish, the chemical constituents of the odor and flavor of fish, and the relation between protein denaturation and textural changes during the frozen storage of fish.

The objective of the composition studies is to provide a knowledge of the constituents in fish and of the factors, such as, season and areas which may affect

them. Information produced from these studies will permit the processor of fishery products to accurately calculate his yield and costs. It will also enable the nutritionist and dietician to make recommendations regarding the components of normal and special diets.

Studies of flavor and odor have as their immediate objectives the identification of those compounds that comprise the flavor and odor of fresh fish, and fish that has deteriorated during storage. The ultimate objective of the investigation is to gain an insight into the chemical processes involved during flavor and odor deterioration so that steps can be taken to prevent these reactions and thereby permit fish products to retain their attractive fresh flavor. Another undesirable change that occurs during frozen storage is an increase in toughness of the meat. This problem is under scrutiny in a study of the fundamental order of arrangement of the molecules comprising the protein of fresh and frozen fish. A solution to this problem will be an important contribution to the efforts of industry to increase the acceptability and demand for their frozen fish products.

Another responsibility of this laboratory is that of maintaining supervision of the U. S. D. I. Voluntary Inspection and Grading program in the New England Region. A team of some 14 highly-trained inspectors sample more than 50 million pounds of fishery products annually, thus assuring that the consumer obtains top quality merchandise. Just about every form of frozen, canned, fresh, raw, cooked, uncooked, breaded fish and/or shellfish is inspected at one time or another by this laboratory's inspectors.

Executing Bureau contract research projects and a special service-to-industry project for furnishing direct technological assistance to industry members rounds out a complete technological service.

CHANGE IN MOISTURE PERCENTAGE

Those unacquainted with the reduction of fish are sometimes surprised at the manner in which percentage of moisture varies during the process of evaporation. To illustrate the point, we might take two extreme examples.

For our first one, suppose that we have 100 pounds of a material containing 2 percent moisture, which means that it contains water in the amount of 2 pounds. Now let us evaporate exactly one half of the water, which would leave 1 pound of it. An analysis of the material then would show that it contains 1.0 percent moisture, about what we would expect.

For our second example, suppose that we start with 100 pounds of material containing 98 percent moisture. The material then would contain water in the amount of 98 pounds. Again let us evaporate one half of the water, which would leave 49 pounds of it. What amount of moisture does the material now contain? Reasoning from the first example, we might hazard 49 percent as a rough off-hand guess. Actually, it would contain 96.1 percent, as the following calculation shows:

$$\frac{(98-49)(100)}{100-49} = \frac{(49)(100)}{51} = 96.1 \text{ percent}$$

Thus care must be taken in mentally estimating changes in moisture content.

COMPOSITION OF ROCKFISH

Rockfish are valuable nutritionally because of the large proportion of high-quality protein they contain. These protein-rich fish are very low both in fat and in sodium content. These characteristics make rockfish valuable for use in special diets as well as in normal diets.

Rockfish are economically important in the fresh and frozen fish industry of the Pacific Coast. The total catch of rockfish landed in Washington, Oregon, and California in 1956 was 26 million pounds. During the same year the amounts of some other species of fish landed in the same area were Pacific salmon 54 million, flounder 52 million, halibut 22 million, and Pacific cod 10 million.

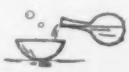
The part of the rockfish that is eaten represents about one-fourth of the whole fish. The remainder of the fish is used to feed mink, trout, poultry, and livestock. Because all of the rockfish is used to feed either human beings or animals, it is important to have a true picture of the nutritive value of (1) the edible meat or fillets, (2) the trimmings, and (3) the whole fish.

Chemists at the Seattle Technological Laboratory of the U. S. Bureau of Commercial Fisheries have determined the composition of nine species of rockfish. The fish they analyzed represented differences in size of fish and in method by which the fish were preserved until they were analyzed. The chemists wished to determine the composition of the more important species of rockfish and to discover if the composition varied in relation to these differences in species, size, and treatment.

The composition of the different species of rockfish was found to be quite uniform regardless of the size of fish or whether they were frozen, iced, or prepared as frozen fillets.

The nonedible parts of the rockfish were found to contain more than 5 percent of oil and more than 5 percent of ash. The protein content of these parts was found to average more than 16 percent.

Rockfish, which are low in cost and abundant on the west coast of the United States, constitute a highly nutritive source of protein food.



IRRADIATION PRESERVATION OF PACIFIC COD FILLETS

The storage life of Pacific cod fillets that had been subjected to pasteurization dosages of irradiation and then held at refrigerator temperatures was increased by about three times compared with unirradiated fillets stored at the same temperature. A pasteurization level of irradiation is a level at which most of the bacteria present

are destroyed but does not completely sterilize the food. Pasteurized food must be stored under refrigeration.

Chemical and bacteriological tests made on irradiated fish during storage indicate that the changes taking place in fish after irradiation are different from those that take place in unirradiated fish. This can be attributed to the fact that irradiation alters the type and number of bacteria that survive, and apparently changes the manner in which spoilage takes place. The usual laboratory tests for freshness cannot be used to judge the quality of irradiated fillets of Pacific cod. The judgment of an experienced taste panel therefore was used to compare the quality of the irradiated samples and determine their storage life.

These studies were undertaken by chemists at the U. S. Bureau of Commercial Fisheries Seattle Technological Laboratory in cooperation with the Quartermaster Food and Container Institute for the Armed Forces as a part of their program for determining the potential value of ionizing radiation for the preservation of fishery products.

All of the irradiated samples tended to have a slight radiation odor and flavor, which is described by most tasters as scorched or burnt. The taste panel could not distinguish among samples of cod fillets that had been subjected to pasteurization at several low levels of irradiation. Samples of Pacific cod that had been subjected to large doses of irradiation, however, were judged to be unacceptable.

The approximate storage life of the various samples of cod fillets stored at 32° to 35° F. was as follows:

Control sample (no irradiation)	1 to 2 weeks
0.1-, 0.2-, 0.23-, and 0.46-megarad samples	6 to 9 weeks
0.7-megarad samples	6 to 12 weeks

Note: Megarad = 1 million Rads. Rad = The quantity of ionizing radiation which results in the adsorption of 100 ergs per gram of irradiated material at the point of interest. Erg = Unit of energy. 1-foot pound = 1,356,000 ergs.

IT'S FISH 'N' SEAFOOD TIME

The U. S. Bureau of Commercial Fisheries is cooperating with the Commercial Fishing Industry in its first annual industry-wide Lenten Promotion. The theme of the 1960 Lenten promotion, which peaks March 2 to April 17, will be "It's Fish 'N' Seafood Time." Menu variety will be emphasized in advertising, publicity, and merchandising material.

The Bureau has developed and distributed a variety of educational and informational materials for use during this year's Lenten promotion. This includes: A fish-fact bulletin for newspaper food editors and other food publicists; five school lunch bulletins; bulletins for restaurant and institutional use; black and white food photographs for use by the newspaper food editors; and two special animated public service television spots, in 60-, 20-, and 10-second versions, for distribution to the major television stations in the United States. In addition, Bureau marketing specialists and home economists will be appearing on radio and television. Bureau materials will stress menu variety, ease of preparation, nutritional value, and other health benefits accruing from increased use of fish and shellfish in the diet.

TRENDS AND DEVELOPMENTS

Marine Biology Laboratory in Randolph (Mass.) High School

Students in the sophmore class at Randolph High School in Randolph, Mass., a suburb of Boston, are making contributions to marine biology and oceanography through a recently well-organized oceanographic laboratory at the school. The laboratory and its procedures were set up by biology instructor Kenneth Sherman, a former employee of the U. S. Fish- and Wildlife Service's Division of Biological Research. The Randolph High School laboratory copies the research methods and problem-solving techniques of the Service's biologists. It is hoped the laboratory will aid in the development of oceanographic scientists for the future, and at the same time contribute in some small way to ocean science.

The emphasis on ocean research is recent. Here is a frontier of science to challenge the imagination of any alert student. Problems concerning every basic biological concept are present. Here is an environment that presents a great opportunity for original investigation. Little or nothing is known concerning a large number of common marine organisms, especially those which have no particular commercial importance. The physiology, morphology, and ecology of only a small number of marine organisms is now generally understood. There are many gaps in our knowledge concerning the fishes and other marine organisms of the North Atlantic coast. As a result

Fig. 1 - Several members of the Randolph High School oceanographic laboratory staff at works (left to right) Fred Hubble and Robert Merritt are examining plankton collected for their productivity studies. George Fahey is busy checking through the literature concerning the distribution of the tomcod, while Peter McGrath is shown grinding down a bone (otolith) taken from the skull in an effort to observe the growth pattern of annual rings similar to those found in a tree. Everett Schaner is examining the gonads as part of his fecundity study of the same fish.

of this lack of knowledge and increased interest in the oceans, the Randolph High School oceanographic laboratory was formed. The laboratory has given the participating students a unique opportunity to become familiar with research methods and problem-solving techniques.

The laboratory began with a small group of students with high aptitudes and a genuine curiosity concerning the oceans. The students were selected on a competitive basis. The five classes of sophomore biology students were given two lessons

Fig. 2 - Peter McGrath weighing a tomcod as part of his age and growth study.

concerned with the cycle of life in the ocean with particular emphasis on its origin, economic importance, and untapped resources. The students were then required to complete a report of approximately 1,500 words entitled, "The Cycle of Life in the Oceans," using at least three different reference books. Those students that produced the most comprehensive reports were later interviewed and from this group 10 who showed a genuine curiosity, interest, and aptitude were selected to become staff members of the laboratory.

The students were then encouraged to familiarize themselves with the oceanographic literature. They discussed their findings at a meeting where it was generally held that while there were a great many excellent problems to work on, many were impractical from the standpoint of available equipment, time, and the difficulty of securing adequate samples. It was decided to begin the studies with readily available fish which not only provided interesting problems but also the opportunity to secure valuable scientific data.

The investigations currently in progress are concerned with the food habits, fecundity, growth, and distribution of some marine fishes of the Atlantic Coast. One of the studies includes the tagging of the commercially-important cod, Gadus callarinas, in an effort to determine the distribution pattern. A 16-foot 18-horsepower motorboat is used for tagging along the coast.

Another project is concerned with determining the distribution patterns of the haddock, Melanogrammus aeglefinis, by attempting to use the infestation pattern

Fig. 3 - Everett Schaner removing the ovaries of a ripe female tomcod. Later he will determine the total number of eggs contained by this individual as part of his fecundity study.

of attached parasites as natural tags. Students are also working on other problems. The food habits of the winter flounder, Pseudopleuronectes americanus, the tomcod, Microgadus tomcod, and the Atlantic cod, Gadus callarias, are under investigation by individual students. While some fish are collected by handlining from the laboratory's 16-foot boat, others are obtained from cooperative fishermen in the local ports of Boston, Cohasset, Scituate, and Hull. Much of the field work is done outside regular school hours.

Fecundity studies requiring careful dissection and measurement of the gonads of the tomcod are in progress. Students are carefully examining, weighing, and classifying the stomach contents of this fish as part of another project. Still another group is concerned with determining the rate of growth of the tomcod. They are studying the various hard bony parts and have found that close examination of the otolith bones, which are found in the skull, reveal the presence of annual rings, similar to the growth pattern found in a cross-section of some north temperate trees, which they feel will be useful in age determination of this fish.

Fig. 4 - Fred Hubble (left to right) and Robert Merritt examine samples of plankton taken from surface tows off the coast of Hull Bay, Mass. George Fahey is busy checking the feeding habits of the tomcod for possible correlation with the plankton productivity investigation.

Plankton tows are taken when possible for use in productivity studies of the local coastal area and also for possible correlation with food habits of the fishes under investigation. Samples of sea water are analyzed at the laboratory periodically for phytoplankton, dissolved oxygen, and salinity determination.

Bibliographic work is done by a special library staff of the laboratory which secures the necessary reference books for the various student project leaders.

The students plan to visit the Oceanographic Institutes at Woods Hole, Mass., in the near future. There they will discuss their own work with scientists actively engaged in similar projects for the Hydrographic Office of the Navy and the U. S. Fish and Wildlife Service.

Through these studies, participating students gain a more comprehensive understanding of scientific methods and principles. There are also good indications that a number of these talented students could conceivably contribute in some small way to a better understanding of basic biological principles.

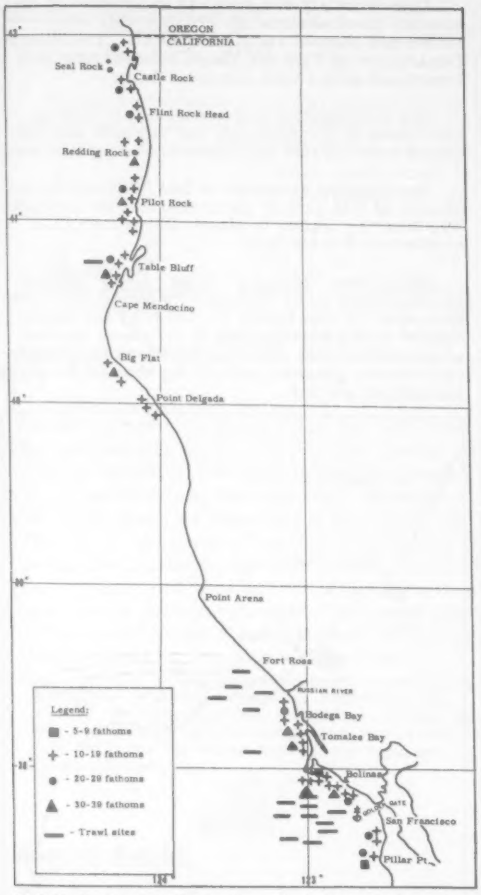
California

CRAB DISTRIBUTION AND ABUNDANCE STUDIES CONTINUED:

M/V "N. B. Scofield" Cruise 59S7-Crab: The California coastal waters from San Francisco to Oregon were surveyed (October 15-November 23, 1959) by the California Department of Fish and Game's research vessel N. B. Scofield to determine the distribution, abundance, composition and condition of market or Dungeness crabs within traditional fishing grounds. Other objectives were to conduct exploratory crab fishing in areas lightly exploited by the fishing fleet and to determine the comparative meat yield of hard and soft crabs.

Fifty-two traps of uniform sizes, without escape ports but in every other respect--including baits--comparable to those of the commercial fishery, were employed in depths of 7 to 35 fathoms in 60 separate settings of 16 to 18 traps each. Otter boards and mudlines were utilized on trawling nets of $3\frac{1}{2}$- and 5-inch mesh in 17 exploratory locations at depths of 28 to 120 fathoms. Crabs were captured at each of the 60 trap string locations.

Crabs were taken in 16 of the 17 exploratory trawls. While net sizes, cable meter tests, and technical difficulties affected certain catches, distributional data indicated legal crabs were in depths of 28 to 120 fathoms.



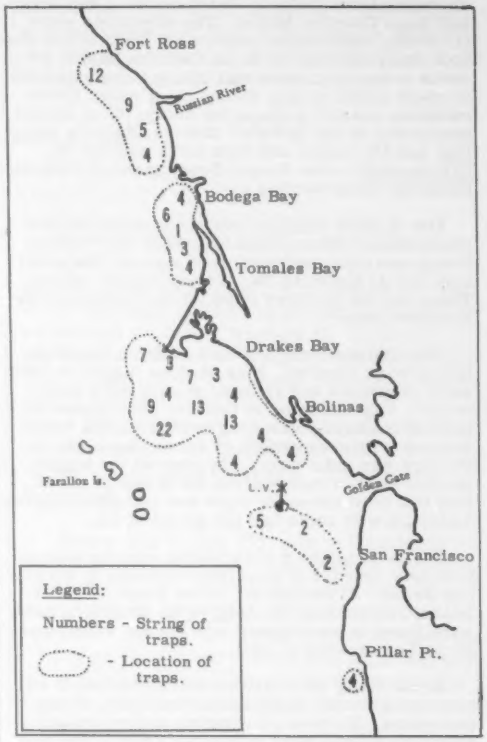
M/V N. B. Scofield Cruise 59S7-Crab (Oct. 14-Nov. 25) 1959).

Soft crabs were increasingly abundant to the northward.

Experiments designed to determine the comparative meat yields of hard and soft crabs showed that soft crabs yield 30 percent less cooked meat than hard crabs of the same live weight and size.

A Nansen bottle, reversing thermometer, and bathythermograph were utilized to gather oceanographic and environmental data relevant to the crab fishery.

Airplane Spotting Flight 59-22-Crab: The California coastal waters from Half Moon Bay to Point Arena were surveyed from the air on December 3, 1959, by the Department's Cessna 182 to determine the fishing locations and relative densities of the central California crab fleet.



Flight report Cessna 182, 59-22-Crab (Dec. 3, 1959).

While conditions for aerial observation were generally good, rising swells and an increasing sun angle diminished visibility from Bolinas Point southward.

In all, 158 strings of traps were counted. The most intensive concentrations occurred from Point Reyes to Bolinas Bay. A majority of the settings were well offshore, many in depths of 30-35 fathoms.

Note: Also see Commercial Fisheries Review, February 1959, p. 13, March 1959, p. 31, and July 1959, p. 25.

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INVESTIGATION OF ABALONE RESOURCES CONTINUED:

M/V "Nautilus" and Diving Boat "Mollusk" Cruise 59N4-Abalone: The abalone investigations were continued from September 9-October 25, 1959, by the California Fish and Game Department's research vessel Nautilus and diving boat Mollusk in waters off the southern California

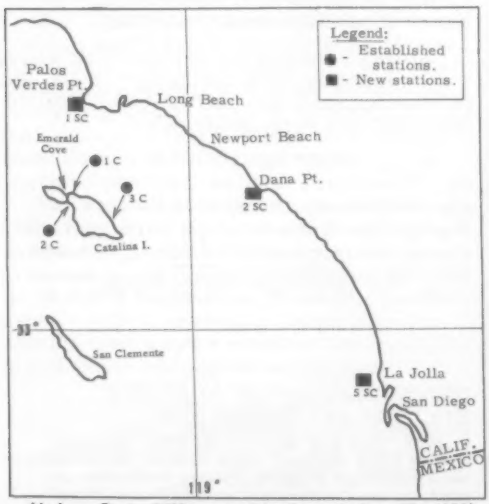
shoreline from Redondo Beach south to San Diego, and Santa Catalina Island. The objectives were (1) to film underwater sequences; (2) to check abalone study stations off Santa Catalina Island; (3) to check areas of commercial diving along coast; (4) to check areas of skin diving along coast; (5) to establish coastal stations for study; (6) to collect specimens of the threaded abalone, Haliotis assimilis; and (7) collect and ship black abalone (H. cracherodii) to the Hawaii Department of Fish and Game for transplanting at Oahu.

Due to dirty water it was not possible to film the artificial habitat (streetcars) in the Redondo Beach area but pictures were taken of the artificial reef at Emerald Bay, Santa Catalina Island. These motion pictures were for inclusion in a Department film.

The abalone study stations on Santa Catalina Island were checked. Pink abalone tagged in 1958 were recovered and rates of growth were determined. Tags attached in October 1958 appeared to be successfully resisting corrosion and wear; In some instances growth of encrusting algae on the tags was quite heavy. In general the tagged abalone had not moved from the areas in which they had been released; most had not added appreciable growth; some had not grown at all.

The most striking observation was the almost complete absence of kelp (Macrocystis) in the station areas. At Station No. 1C on Santa Catalina Island, red abalone (H. rufescens) planted in 1956 were found to have moved into deeper water, apparently in search of food.

Areas along the coastline were checked in an attempt to assess commercial and sport diving pressures. However, during the entire cruise water conditions were unfavorable for diving and observations were limited. Stations were established as indicated on the accompanying map.



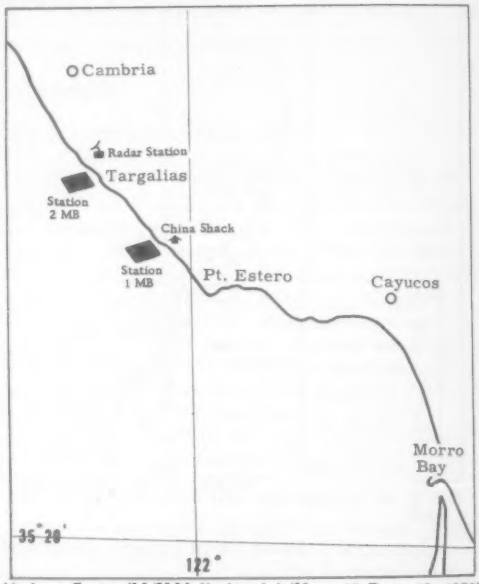
Abalone Cruise 59N4 and 59M3 (Sept. 9-Oct. 25, 1959).

Approximately 400 small (¾ to 3 inches in diameter) black abalone (H. cracherodii) were collected and shipped via air to Hawaii. The Hawaii Department of Fish and Game planted them in a restricted area on the island of Oahu.

The investigation was successful in finding specimens of H. assimilis, the threaded abalone. These were located just north of Portuguese Bend.

The Nautilus remained at San Pedro at the conclusion of this part of the cruise and the Mollusk was taken by trailer to Morro Bay where field studies were continued.

Diving Boat "Mollusk" Cruise 59M3-Abalone: Investigations were continued in Morro Bay from November 10-December 10, 1959, by the Department's diving boat Mollusk to (1) check abalone study stations; (2) observe conditions on commercial abalone grounds; and (3) tag abalone for growth and habitat studies.



Abalone Cruise (M/V Mollusk only) (Nov. 10-Dec. 10, 1959).

Rough weather limited diving activities to 3 days during this one-month cruise period. Observations revealed a large number of 8-inch abalone in this area and almost all (between 400-500) showed new shell growth. This growth occurred since August 1959 when previous dives were made. Nereocystis has returned and is abundant. It extends over a greater area than in the years before its disappearance.

Note: Also see Commercial Fisheries Review, December 1959 p. 40.

Cans--Shipments for Fishery Products, 1959

Total shipments of metal cans for fishery products in 1959 amounted to 115,453 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 123,602 tons in 1958, a decline of 6 percent. Shipments of metal cans in 1957 amounted to 114,560 tons and in 1956 totaled 112,532 tons.

The drop in the shipment of cans for fishery products from 1958 to 1959 was due primarily to sharply lower packs of Pacific salmon, California and Maine sardines, anchovies, and shrimp. However, the 1959 pack of tuna set a new record. The over-all pack of principal fishery products (salmon, sardines, tuna, shrimp, anchovies, and mackerel) amounted to about 514.2 million pounds, lower by about 6.2 percent from the 1958 pack (548.4 million pounds) of the same products.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.

Central Pacific Fisheries Investigations

HAWAII'S SKIPJACK TUNA LANDINGS HIGHER IN JANUARY 1960:

Preliminary figures on Hawaii's landings of skipjack tuna of 144,000 pounds in January 1960 indicate an increase of 40,000 pounds as compared with January 1959. Data are supplied to the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu by the tuna packing industry and the Hawaiian Division of Fish and Game.

Length measurements made on the fish as they are landed at the cannery showed the catches were composed of 4- to 20-pound skipjack with modes at 6, 9, and 20 pounds. Although the sample was small (226 fish), the presence of the 20-pound mode during a mid-winter month is somewhat unusual. The fishermen reported that there were numerous small schools, and that the fish were often wild and difficult to catch.

* * * * *

NEW UNDERWATER OBSERVATION CHAMBER ADDED TO RESEARCH VESSEL:

During January 1960 a new bow extension, incorporating an underwater observation chamber, was added to the U. S. Bureau of Commercial Fisheries' research vessel Charles H. Gilbert while she was in a West Coast Shipyard. The vessel now equipped for underwater observations from both the stern and the bow, will conduct tuna behavior studies off the coasts of California and Central America in April before returning to Honolulu.

Since 1957, the Bureau's Honolulu Biological Laboratory has been developing equipment and techniques for direct underwater observations of tuna behavior. The first installation aboard the Charles H. Gilbert involved a diver with an aqua lung positioned on an overside ladder. Improvements in the underwater observation techniques led finally to a chamber within the hull of the vessel. By means of visual observations, supplemented with movie and still camera records, studies were made during actual fishing operations, both standard and under various experimental situations.

Conservation

FISH AND WILDLIFE'S ROLE IN NATION'S ECONOMY DISCUSSED AT MEETING:

The role of fish and wildlife in our present economy was explored on January 14, 1960, in a meeting between the Secretary of the Interior and representatives of oil companies and conservation associations. This is the second such meeting, the first having been held about a year and a half ago.

After a welcome by the Secretary, the discussions were launched by a series of remarks by oil company officials, each

explaining what his company was doing in the field of fish and wildlife conservation.

These explanations were followed by discussion of such subjects as the need for future study, planning, and methods of expediting the exchange of information between the companies and the conservation groups.

Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, 1955-59:

Fresh and Frozen Fishery Products: During the calendar year 1959 purchases of fresh and frozen fishery products by the Department of Defense for the use of the Armed Forces amounted to 22.7 million pounds, valued at $11.6 million. This amount was slightly higher (0.6 percent) in quantity, but was lower by 9.5 percent in value as compared with the preceding year. Prices paid for fresh and frozen fishery products in 1959 by the Department of Defense averaged 51.3 cents a pound, lower by 5.8 cents a pound from the 1958 average of 57.1 cents. This was due mainly to lower market prices for most fishery products in 1959. For the five-year period 1955-59, purchases varied between a high of 26.6 million pounds in 1956 to a low of 22.5 million pounds in 1958. Prices paid per pound jumped sharply from the over-all average of 43.7 cents a pound paid in 1955 to the peak price paid in 1958.

Canned Fishery Products: Purchases of canned fishery products in 1959 were down sharply from the preceding year. Purchases of canned tuna (3.7 million pounds) were down 37.2 percent from the 5.9 million pounds purchased in 1958, canned salmon purchases dropped 67.5 percent, or from 3.3 million pounds in 1958 to 1.1 million pounds in 1959. However, purchases of canned sardines in 1959 of about 1.1 million pounds were up 315 percent from the preceding year and close to seven times the purchases made in 1955. Canned salmon purchases made in 1959 were the lowest in five years, but the pack was the lowest in history. Canned tuna purchases, although down from 1958, were the second highest purchases made in the period 1955-59.

DEPARTMENT OF DEFENSE PURCHASES, JANUARY 1960:

Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, 1.5 million pounds (value $737,000) of fresh and frozen fishery products were purchased in January 1960 by the Military Subsistence Supply Agency. This was lower than the quantity purchased in December 1959 by 15.7 percent, but was 0.5 percent above the amount purchased in January 1958. The value of the purchases in January 1960 was lower by 15.9 percent as compared with December 1959 and 12.7 percent less than for January 1959.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, January 1960 with Comparisons

QUANTITY			VALUE		
January		Jan.-Dec.	January		Jan.-Dec.
1960	1959	1959	1960	1959	1959
(1,000 Lbs.)			($1,000)		
1,497	1,489	22,651	737	844	11,624

Prices paid for fresh and frozen fishery products by the Department of Defense in January 1960 averaged 49.2 cents a pound, about 0.2 cents less than the 49.4 cents paid in December 1959 and 7.5 cents less than the 56.7 cents paid during January 1959. The lower average price for purchases this January as compared with January a year ago was due to a sharp drop in fillet, shrimp, and scallop prices.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, 1955-59

Product	1959		1958		1957		1956		1955	
	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value
	1,000 Lbs.	$1,000	1,000 Lbs.	$1,000	1,000 Lbs.	$1,000	1,000 Lbs.	$1,000	1,000 Lbs.	$1,000
Fresh and Frozen Fishery Products	22,651	11,624	22,511	12,850	23,452	12,080	26,610	13,413	24,989	10,929

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, 1955-59

Product	Quantity				
	1959	1958	1957	1956	1955
	(1,000 Lbs.)				
Tuna	3,698	5,884	2,711	3,334	2,906
Salmon	1,085	3,336	3,111	2,798	2,785
Sardines	1,051	253	215	236	143
Total	5,834	9,473	6,037	6,368	5,834

* * * * *

Canned Fishery Products: Tuna was the only canned fishery product purchased in quantity for the use of the Armed Forces during January this year. Purchases of canned tuna in January 1960 were up about 17 percent from January a year ago. However, the value of the canned tuna purchases this year was only 42.4 cents a pound as compared with 49.7 cents in January 1959.

Note: Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, January 1960 with Comparisons

Product	QUANTITY			VALUE		
	January		Jan.-Dec.	January		Jan.-Dec.
	1960	1959	1959	1960	1959	1959
	(1,000 Lbs.)			($1,000)		
Tuna	451	385	3,698	191	192	1,672
Salmon	-	-	1,085	-	-	737
Sardine	6	12	1,051	4	4	177

Inspection of Fishery Products

OVER 42 MILLION POUNDS PACKED IN 1959 UNDER GOVERNMENT INSPECTION BY SOUTH ATLANTIC AND GULF STATES FISHERY PLANTS:

Inspection and grading services for fishery products became the responsibility of the U. S. Department of the Interior on July 1, 1958. Inspection and grading services are available on a fee basis to processors who meet the existing voluntary Federal standards of quality for fishery products. A U. S. Bureau of Commercial Fisheries inspection corps has been given specialized training and assigned to the fishery plants throughout the country which requested voluntary continuous inspection of their products. This service provides that an inspector or inspectors be stationed at each plant during all shifts of the processing operation. The inspector (a) checks plant personnel and equipment for sanitation, (b) checks the raw material for wholesomeness, (c) checks the processing of the finished products, and (d) selects finished product samples for grading. When the final inspection of the finished product is made, he will issue certificates attesting to the grade or quality and condition of the lot. He also furnishes plant management with a daily inspection report commenting on the sanitary conditions and the results of the products inspection.

Continuous inspection services assure the processor and purchaser of satisfactory compliance with the requirements for wholesomeness of the raw materials used and of sanitation established for the handling and processing operations.

Twenty-nine plants have applied and are now under continuous inspection. Of this total, 14 are located in the South Atlantic and Gulf States. From July 1, 1958 (when continuous inspection of fishery products was started by the U. S. Department of the Interior) through December 1958, a total of almost 11.4 million pounds of fishery products was packed by 10 plants in the South Atlantic and Gulf States. Of this amount, almost 11.2 million pounds was frozen raw breaded shrimp. In 1959, 14 plants in those states were packing under continuous inspection and in the 12 months of that year a total of 42.3 million pounds of products was packed. Of that total, 36.2 million pounds was frozen raw breaded shrimp.

Marketing

EDIBLE FISHERY PRODUCTS MARKETING PROSPECTS, FIRST QUARTER 1960:

United States civilian per capita consumption of fishery products in 1959 is estimated to have been 10.7 pounds, a little more than a year earlier. The rate for the fresh and frozen products was about the same as in 1958, but there was some increase for the canned items. Current supplies appear adequate to maintain consumption by civilians at about the same rate this winter and early spring as last. A probable gain for the fresh and frozen fishery products is likely to counterbalance a decline for the canned. Retail prices of fishery products averaged somewhat lower than in 1958, when they were record high. Expectations are that prices in the next few months will likely be relatively stable, though averaging lower than a year earlier.

The catch of food fish and shellfish was more than a tenth lower in 1959 than in 1958. The reduction was principally in the species that are canned. Commercial landings were at the low point of the year in the winter and started increasing seasonally in early spring.

Fishery Products Packed in South Atlantic and Gulf States Plants Under U. S. D. I. Inspection

Product	In Pkgs. of Less than 2 Lbs.				In Pkgs. of 2 Lbs. & Over				Total Quantity Pkg'd.	
	12 Mos. 1959		July-Dec. 1958		12 Mos. 1959		July-Dec. 1958		12 Mos. 1959	July-Dec. 1958
	No. Plants	Quantity (1,000 Lbs.)	No. Plants	Quantity (1,000 Lbs.)	No. Plants	Quantity (1,000 Lbs.)	No. Plants	Quantity (1,000 Lbs.)	Quantity (1,000 Lbs.)	
Shrimp, frozen, raw:										
Breaded	14	19,655	10	6,017	14	16,504	10	5,137	36,159	2/ 11,154
Peeled & deveined	12	1,637	3	99	11	1,066	2	1/	2,703	99
In shell	7	535	1	1/	10	1,312	2	1/	1,847	3/
Total	14	21,827	10	6,116	14	18,882	10	5,137	40,709	11,253
Other products 4/									1,631	108
Grand total									42,340	11,361

1/ Packed by less than 3 plants and included with "breaded."
2/ Includes small quantity of "peeled & deveined" and "in shell" products packed by less than 3 plants.
3/ Included with "breaded" because packed by less than 3 plants.
4/ Includes specialty shrimp products, crab meat, crab meat stocks, devilled crabs, crab patties, lobster cutlets, lobster steaks, lobster tails, breaded oysters, breaded scallops, catfish, flounder, breaded fish fillets, raw and cooked fish sticks, red snapper tenderloin, snapper fingers, swordfish, and breaded trout fillets.
Note: Plants covered in 1959 were located: 2 in Ga., 5 in Fla., 1 in La., and 6 in Tex.

Production of canned fishery products was around 20 percent lower last year than in 1958. Tuna and mackerel were the only major canned products for which output was higher in 1959. The pack of salmon was a third less than in 1958 and the smallest since 1898. Production of canned salmon has been on the downtrend, particularly in the past decade, because of the scarcity of fish. About a sixth fewer Maine sardines and two-thirds fewer California pilchards were packed last year. Per capita consumption of canned fishery products was maintained at a somewhat higher rate in 1959 than in 1958 by moderately larger imports and by drawing on the large stocks which were on hand at the beginning of 1959. Accordingly, supplies of the canned products available for distribution in the next several months are noticeably lower than a year earlier.

The stocks of frozen edible fishery products were larger this February 1 than last. Stocks represent the primary source of frozen fish and shellfish supplies until the seasonal pickup in the commercial catch in early spring.

Imports of fishery products were moderately larger in 1959 than in 1958. Increases occurred both for the fresh and frozen and the canned products. Exports were up substantially from 1958 because of the sharply increased movement abroad of the canned products--particularly of California pilchards, salmon, and squid. Prospects for the next several months are that imports of fishery products will continue at a high rate, but exports will likely be substantially lower than in the winter and spring of 1959.

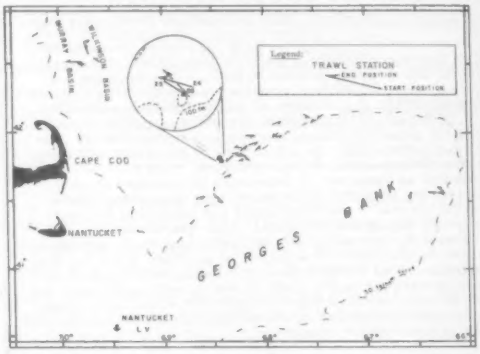
This analysis appeared in a report prepared by the Agricultural Marketing Service, U. S. Department of Agriculture, in cooperation with the Bureau of Commercial Fisheries, U. S. Department of the Interior, and published in the former agency's February 25, 1960, release of The National Food Situation (NFS-91).

North Atlantic Fisheries Exploration and Gear Research

WINTER DISTRIBUTION OF WHITING STUDIED:

M/V "Delaware" Cruise 60-1: To investigate the winter distribution of whiting in deep water was the objective of a January 1960 cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. The cruise was divided into two phases.

PHASE I: Although bad weather hampered fishing operations, 31 successful tows were made in depths ranging from



M/V Delaware Cruise 60-1, Phase I (January 5-15, 1960).

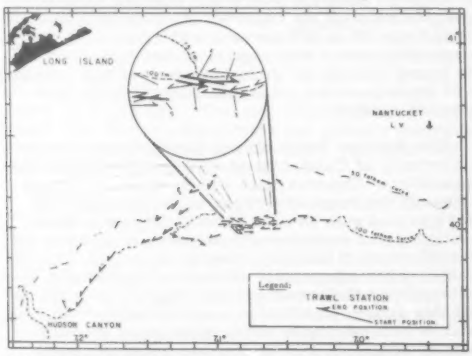
40 to 154 fathoms in selected areas lying near or along the edge of the northern and eastern parts of Georges Bank and in Wilkinson and Murray Basins. In spite of efforts to choose appropriate areas for trawling, three tows resulted in some damage to the net.

Of the better catches was an estimated 2,500 pounds total catch for the No. 36 trawl with liner at trawl station No. 24, with 5,000 and 7,000 pounds for two subsequent tows with the large whiting net in the same area at trawl stations Nos. 25 and 26. These catches consisted of an estimated 2,000, 4,000, and 5,000 pounds of whiting, respectively, with hake (Urophycis chuss) making up most of the remainder of the catches. The total catch from the three stations included less than 500 pounds of other fish. These and other tows used the same type of equipment as described above, and were of 45-minute duration.

All of the whiting were M. bilinearis; no M. albidus were taken.

In cooperation with the Woods Hole Oceanographic Institution's study of surface currents, 288 drift bottles were released at 48 locations, and a number of bathythermograph casts were made during both phases of this cruise.

PHASE II: The Delaware found commercial concentrations of whiting (M. bilinearis and M. albidus) in an area extending from lat. 40°03' N., long. 70°15' 30" W. to lat. 39°33' N., long. 72°08' W., at a depth of 100 fathoms. In five of the 1-hour exploratory tows, a catch of 15 tons of marketable-size whiting was obtained. The species composition of these commercial tows was predominantly of the common commercial whiting.



M/V Delaware Cruise 60-1, Phase II (January 19-30, 1960).

In the best fishing area, there was a relatively small amount of hake (Urophycis chuss) mixed in with the whiting. Two night tows were made in the area: one tow in the 100-fathom depth had a yield of 5,000 pounds; the other in a 175-fathom depth had 1,000 pounds. Other sections of the area surveyed produced whiting and hake in lesser amounts. A total of 44 tows were made.

During night fishing, nylon gill nets, fished vertically from the surface to a depth of 15 fathoms, were used. Results showed that it is possible to use this method for attempts to sample mid-depth zones; however, fish were not caught during these experimental tests.

Echo-sounder observations indicated considerable quantities of fish near the bottom but none at midwater trawling depth; therefore, midwater trawling was not attempted.

Approximately 1,300 whiting (M. albidus) were preserved by freezing and were turned over to the Woods Hole Biological Laboratory for detailed study. Other preserved specimens included several tilefish (Lopholatilus chamaeleonticeps) of various sizes.

GEAR AND METHODS: A No. 36 trawl (60' head rope, 80' foot rope, $\frac{1}{2}$" small mesh liner) was used as a try-net. When favorable signs of whiting resulted from tows made with this net, a large commercial whiting trawl (76' head rope, 96' foot rope, 2" mesh, $1\frac{1}{2}$" cod end) was towed in the same area. By this method of operation, it was possible to avoid incurring excessive damage to the large whiting trawl during exploratory tows and to compare the fishing effectiveness of the two nets.

NEXT TRIP: The M/V Delaware left Gloucester, Mass., February 11, 1960, for Cruise 60-2. The cruise was to be divided into three phases. The first and third phases were to be conducted under the direction of the Bureau's Biological Laboratory, Woods Hole, Mass., and consist of hydrographic and trawling transects along the coast from Cape Hatteras to Martha's Vineyard.

During the second phase, Exploratory Fishing and Gear Research was to conduct deep-water trawling to extend the area of exploration for red crabs (Geryon quinquedens) and other deep-water species of fish and shellfish, investigated during M/V Delaware Cruise 59-7 off the Middle Atlantic area.

The vessel was scheduled to make port in Norfolk, Va., after the first phase and to return to Gloucester on or about February 29, 1960.

North Atlantic Fisheries Investigations

CONTRACT LET FOR DESIGN OF NEW FISHERY RESEARCH VESSEL TO REPLACE "ALBATROSS III:"

The U. S. Bureau of Commercial Fisheries has selected a firm of Boston naval architects to provide architectural services for the design and construction of a new fishery research vessel to replace the Albatross III. The Albatross III was deactivated in March 1959, because of excessive costs of repair and maintenance. Included in fiscal year 1961 Federal Budget is an item of $2,055,000, earmarked for the Bureau's new research vessel.

The Bureau's plans call for a vessel 175-180 feet over-all length with a beam of 33 feet, developing 1,600-1,800 hp. and a speed of about 14 knots. Equipment will include laboratories and other facilities necessary to carry out the research and survey work required of the new vessel. The vessel will conduct fishery research in the Northwest Atlantic, with the major emphasis on groundfish species.

It is expected that plans and specifications will be completed in time to award contracts for construction late in 1960.

Oceanography

NATIONAL OCEANOGRAPHIC EXPEDITION BY COAST AND GEODETIC SURVEY VESSEL:

The survey ship Explorer began an extensive oceanographic expedition en route from Seattle, Wash., by way of the Panama Canal to Norfolk, Va., February 1, 1960, the Director of the Coast and Geodetic Survey, U. S. Department of Commerce, announced recently. This modern oceanographic cruise will be the first full-scale expedition of its kind by the Survey since historic oceanographic surveys were made by the ship Blake, in the early 1880's.

The Explorer will extend her normal transfer time from the West to the East coast by more than two months in order to investigate various oceanographic features along the route. The 220-foot long ship is being reassigned for service along the east coast of the United States and will be replaced in the Alaska survey fleet by the new ship Surveyor which will soon be commissioned at San Diego.

The expedition is being supported in part by a grant from the National Science Foundation and is a cooperative venture with 12 or more organizations participating.

The Fish and Wildlife Service and the Geological Survey of the U. S. Department of the Interior are vitally interested in this expedition. A geological survey of the Swan Islands will be undertaken; and, for the Fish and Wildlife Service, dredgings to recover bottom-dwelling animals will be made in the Caribbean and in the Straits of Florida. Mammals, reptiles, and insects will be collected on the Swan Islands for the U. S. National Museum of the Smithsonian Institution. An attempt will be made to capture live animals on these islands for the National Zoological Park.

Samples of ocean bottom sediments to be tested for radioactivity will be collected for the U. S. Public Health Service for use in its radio chemical surveillance program.

The U. S. Navy Electronics Laboratory at San Diego will have on board a deep-sea camera for photographing the ocean bottom off the West coast of Central America where the Russian oceanographic ship Vityaz reported the bottom to be covered from 80 to 100 percent with nodules of manganese which were also high in nickel and cobalt. It is hoped that the northern boundary of this potential ore deposit can be determined by the deep-sea camera studies.

The Scripps Institution of Oceanography of the University of California is also cooperating in the expedition. Observations will be made at 11 positions off the coast of Oregon in cooperation with Scripps and with Oregon State College. At each station water samples will be obtained to study the distributions of salinity, dissolved oxygen, phosphate, and temperature; all data of importance in determining the oceanographic regime or make up off this coast. In addition, surface water samples will be obtained from which it is hoped that suspended sediment will help oceanographers learn what happens to Columbia River water once it enters the Pacific.

Scripps has provided a magnetometer which will be towed behind the Explorer from San Diego to Norfolk. This instrument will provide a continuous record of the earth's magnetic field along the ship's track. This information, coupled with records of the bottom topography, will add considerably to man's knowledge of the intricate magnetic field of the earth. If the magnetometer discovers unsuspected or unexplained magnetic "hills" or "valleys," the ship's plans are such that extra time can be taken to survey the area in more detail.

Throughout the entire expedition current drift bottles will be dropped at regular intervals with cards enclosed asking the finders to inform the Coast and Geodetic Survey where the bottles have been recovered. It is hoped that these bottles will provide clues to the circulation of the waters along the Pacific Coast of North and Central America, of the western Caribbean, and the Gulf of Mexico, and will add to our knowledge of the mighty Gulf Stream.

The ocean's temperature will be taken at hourly intervals throughout the trip. An instrument will

be lowered which will provide the oceanographers with a profile of temperature versus depth.

Oceanographic observations similar to those off the Oregon coast will be made at regular intervals in the Pacific, the Caribbean, Gulf of Mexico, and along the Atlantic Coast.

The bottom sediments along the route will be studied by means of cores and dredges. The shelf around the United States Swan Islands will be extensively studied. These limestone islands cap a small bank that drops off abruptly to the north to depths of over 3,000 fathoms (18,000 feet) in the Cayman Trough. An objective of these investigations is to attempt to ascertain whether these islands are related to the complex of cays (small islands) and banks off Honduras or if the origin is structural and related to the massive Cayman Trough.

It is hoped that dredging for rock on the steep slopes south of the Florida Keys will provide information on the structure of this interesting area.

Of special interest will be measurements of the speed and direction of the Gulf Stream, not only at the surface but at depths down to about 1,500 feet. Observations of this important "river in the sea" will be made at the same location at which Lieutenant Pillsbury, commanding the Coast Survey Steamer Blake, made his classic observations some 70 years ago. The new observations will be made with modern equipment and greatly improved techniques in contrast to the crude and time-consuming methods of Pillsbury's day.

The hills and valleys of the ocean bottom will be under constant surveillance by means of electronic echo-sounding equipment aboard the Explorer. Divers from the Coast and Geodetic Survey will explore the ocean bottom, the fish, and marine plant life around the Swan Islands, and plan to photograph the various instruments in use as they are lowered from the Explorer.

Oceanographic activities have been carried on by the Coast and Geodetic Survey since its earliest years. This latest effort will be an extension of pioneering work in the development of equipment and techniques for making oceanographic investigations.

Outdoor Recreation Resources Review Commission

COMMISSION MEETS WITH ADVISORY COUNCIL:

In concluding the two-day meeting in January 1960 of the Outdoor Recreation Resources Review Commission with its Advisory Council, Chairman Laurance S. Rockefeller said that the Commission is well on its way to completing the job assigned to it by the Eighty-Fifth Congress. The meeting was called by the Chairman to gather the advice of the Advisory Council in assisting the Commission to become aware of and evaluate the various problems of meeting present recreational needs facing the nation on a Federal, state, and community basis, and anticipating those needs for the years 1976 and 2000.

The meeting in Washington brought together the eight Congressional Commissioners and seven Presidential appointees of the Commission, with the 25 citizens and 14 Federal liaison officers who make up the Advisory Council.

Charles E. Jackson of the National Fisheries Institute is the Commercial Fisheries representative on the Advisory Council. Jackson said, "It is inevitable that commercial fishing rights will be involved in long-range recreational planning. I am impressed with the broad-minded views of the Commission and Council on the necessity of solving conflicts of interests and the need to consider all economic uses of natural resources like fisheries and forestry."

Salmon

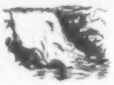
KING SALMON RUN OF CENTRAL CALIFORNIA RIVERS LARGEST SINCE 1954:

The largest king salmon spawning run since 1954 in the central California valleys has been recorded in 1959/60 by the California Department of Fish and Game. The Director said some 480,000 salmon spawned in the Sacramento-San Joaquin River system, the most important king salmon spawning area on the West Coast. In 1954, the number was 482,000.

The 1959/60 mark is well ahead of the previous year's 290,000 king salmon spawners and approaches the 500,000 which the Department has said is the number needed to maintain the commercail and sports fisheries at a high level. Previous high in this decade was attained in 1953 when 597,000 spawners were estimated.

The 1959/60 spawners are progeny of those fish which spawned in the 1955/56 winter--the time of the big flood.

While the count this year is the best in five years, the Director said some losses clouded an otherwise bright picture. Most important of these occurred in the Yuba River where the production of some 3,500 salmon, of a very excellent run of 10,000, was lost below Daguerre Point Dam because of water manipulation which resulted in the stranding of salmon nests and ripe salmon.



Shad

CHESAPEAKE BAY SHAD RUN DELAYED BY COLD WATER:

Late in February 1960, Virginia fishermen were waiting impatiently for the 1960 run of shad in the lower part of Chesapeake Bay. But Virginia Fisheries Laboratory scientists pointed out that the seasonal shad run to the rivers would not take place until water temperatures reached about 45° F. A cold February has kept river temperatures 5° F. too low and few shad had appeared as of the end of that month.

Studies made earlier by Virginia fisheries biologists showed that the greatest catches in the York River system have been when water temperatures ranged between 45° and 59° F. Almost no shad have been caught in the York River at water temperatures below 40° F.

In cooperation with the Virginia Fisheries Laboratory, the U. S. Bureau of Commercial Fisheries will again collect catch records on the York River and its tributaries. Fishermen have already been sent log books in which to record their catches and the Bureau biologists will be on the River about mid-March in order to interview shad fishermen and tag fish.

From last year's tagging program, the scientists were able to estimate that 310,000 shad entered the River to spawn and about half of these were caught by the fishermen.

Previous studies done by the Bureau and Virginia biologists has led to the conclusion that overfishing has not been a serious problem in the York River system during the past 20 years and that further protective legislation is not warrented at this time. Thus, shad fishermen have been able to legally catch as many fish as they could use or sell.

Last year's records indicate that the average weight per buck or male shad was 2.3 pounds and for female or roe shad, 3.2 pounds. In 1959, pound nets took about 3 percent of the total catch; fyke nets, 2 percent; haul seines, less than 1 percent; stake gill nets, 48 percent; and drift gill nets 46 percent of the catch. The age of the shad, as determined from scale samples, showed that the catch was predominantly 3- and 4-year old buck shad and 5-year old roe shad. The oldest fish sampled was 7 years old.

Fishermen have been requested to keep careful records of their catches and to return all tags recovered from fishes as soon as possible. A fishery research biologist from Bureau's Beaufort Laboratory, reports that about 300 shad were tagged on the spawning grounds in 1959 in an attempt to determine if York River shad return to the same stream to spawn in successive years. Fishermen were requested to keep a special look-out for these tags to enable the biologists to complete this phase of their work.

Shrimp

COMPREHENSIVE ECONOMIC STUDY BEGINS:

A comprehensive economic study of domestic shrimp industry production has been inaugurated by the U. S. Bureau of Commercial Fisheries. The study will deal with an intensive analysis of competitive conditions in the industry. A declining trend in catch per vessel and increased foreign competition were noted in an earlier study.1/ These trends will be studied in more detail.

1/ Published as Special Scientific Report-Fisheries Nos. 277 and 308, Survey of the United States Shrimp Industry.

The objectives of the long-range study are to determine the position of the domestic shrimp industry in relation to foreign-based shrimp industries; to examine economic trends in the domestic shrimp industry; to analyze special problems retarding productivity; to recommend measures to solve or mitigate such problems.

The first phase of this study will be done by the University of Florida under a contract from the Bureau. The objectives of this phase are to assess the efficiency of vessel and boat operations in the principal shrimp fisheries of the South Atlantic States and the Gulf of Mexico area; and to appraise each fishery as a potential source of supply, bearing in mind the factor mentioned above and port facilities, labor available, navigational hazards, shore facilities for processing, refrigeration, and transport. This phase of the study will be conducted in the shrimp fisheries in North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas.

Information already available in the files of the Bureau of Commercial Fisheries, data from Federal Trade Commission studies, and from vessel documentations at the Bureau of Customs will be available for the study.

The reason for the study is the economic distress in which the shrimp industry now finds itself, despite the fact that it holds first place in dollar value of all United States fishery products. During World War II and the early postwar years, the domestic shrimp industry prospered. The shrimp catch, which was 143 million pounds in 1938, jumped to 200 million pounds by 1951. Since then it has consistently held to more than 200 million pounds but at no time has it reached the 1954 peak of 268 million pounds.

Improved processing and better markets led to an expansion of demand and, in turn, location of some new fishing grounds, a sharp increase in the number of fishing vessels, and improvements in both equipment and methods of fishing. Even with more vessels at work, there has been a decline in total landings since 1954. This decline in average rate of catch per vessel has resulted in an increase in unit costs of production.

The contract with the University of Florida is financed with funds made available by the Saltonstall-Kennedy Act of 1954. Under the contract terms not more than $16,400 will be spent on Phase I of the study. This phase is to be completed by December 15, 1960.

Standards

HEARINGS ON PROPOSED STANDARDS FOR FROZEN RAW HEADLESS SHRIMP:

Five open meetings were scheduled in March for hearings on the proposed United States Standards for Grade for Frozen Raw Headless Shrimp. The meetings were held in Jacksonville, Fla., New Orleans, La., Corpus Christi, Tex., Los Angeles, Calif., and Chicago, Ill., and conducted by technologists of the U. S. Bureau of Commercial Fisheries. An invitation to attend the hearings was extended to packers, brokers, distributors, users, and others interested in the grade standards for frozen raw headless shrimp.

Tagging

RADIOACTIVE FISH TAG USE LICENSED BY ATOMIC ENERGY COMMISSION:

On February 16, 1960, the Atomic Energy Commission issued a license to the U. S. Bureau of Commercial Fisheries for the use of a new low-level radioactive fish tag to be used in Southeastern Alaska herring migration studies. The new tag, like the old type, is inserted in the body cavity of the herring, but being radioactive, is much more speedily and accurately recovered by special detectors at the processing plant. Thousands of herring will eventually be tagged, released, and then caught again at a later date by fishermen who deliver them to the processing plant. Fish tagged with the radioactive "belly insert tag" are

immediately detected at the plant, recovered, measured, and aged. In this way the strength of year-classes or populations, and the migrations of these fishes may be determined for management purposes. It is not known at present when the tagging program will get under way.

It is unlikely that the public would ever come into contact with the new tag because of many precautionary measures. Even so, the tags are of such low-level radioactivity that no hazard exists.

United States Fishing Fleet 1/ Additions

JANUARY 1960:

A total of 16 vessels of 5 net tons and over was issued first documents as fishing craft during January 1960--a decrease of 13 vessels compared with the same month in 1959. The Chesapeake area led with 5 vessels, followed by the Gulf with 4, and the South Atlantic with 3. The Pacific, the New England, and the Middle Atlantic areas accounted for the remaining 4 vessels.

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft by Areas, January 1960

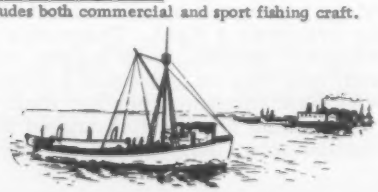
Area	January 1960	January 1959	Total 1959
	(Number)		
New England	1	2	15
Middle Atlantic	1	-	12
Chesapeake	5	9	106
South Atlantic	3	8	76
Gulf	4	6	135
Pacific	2	3	97
Great Lakes	-	1	6
Alaska	-	-	32
Total	16	29	479

Note: Vessels have been assigned to the various areas on the basis of their home ports.

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft by Tonnage, January 1960

Net Tons	Number
5 to 9	7
10 to 19	3
30 to 39	3
40 to 49	3
Total	16

1/ Includes both commercial and sport fishing craft.



U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, DECEMBER 1959:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during December 1959 increased 12.5 percent in quantity and 6.4 percent in value as compared with November 1959. The increase was due primarily to higher imports of groundfish fillets and blocks (up 2.4 million pounds), frozen albacore and other tuna (up 9.8 million pounds), and to a lesser degree, an increase in the imports of Canadian lobsters and fillets other than groundfish. The increase was partly offset by a 3.4-million-pound decrease in the imports of canned tuna in brine, fresh and frozen salmon (down 3.4 million pounds), and canned salmon (down 1.6 million pounds).

United States Foreign Trade in Edible Fishery Products, December 1958 with Comparisons

Item	Quantity			Value		
	December		Year	December		Year
	1959	1958	1958	1959	1958	1958
	(Millions of Lbs.)			(Millions of $).		
Imports:						
Fish & shellfish: Fresh, frozen, & processed 1/	97.8	78.9	956.8	28.2	23.4	278.4
Exports:						
Fish & shellfish: Processed 1/ only (excluding fresh & frozen	5.5	4.4	41.2	1.5	1.2	15.6

1/ Includes pastes, sauces, clam chowder, and juice, and other specialties.

Compared with December 1958, the imports in December 1959 were up 24.0 percent in quantity and 20.5 percent in value due to higher imports of frozen albacore tuna (up 7.1 million pounds), groundfish fillets and blocks (up 7.8 million pounds), and canned tuna in brine (up 3.6 million pounds). Compensating, in part, for the increases was a drop of about 3.5 million pounds in the imports of frozen tuna other than albacore, fresh and frozen salmon (down 1.1 million pounds), and canned salmon (down 1.0 million pounds).

United States exports of processed fish and shellfish in December 1959 were lower by 43.0 percent in quantity and 66.7 percent in value as compared with November 1959.

* * * * *

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1960 at the 12½-percent rate of duty had not been determined as of March 14, 1960. The quota for 1959 was 52,372,574 pounds. Any imports in excess of the quota are dutiable at 25 percent ad valorem.

Imports from January 1-February 27, 1960, amounted to 5,168,179 pounds, according to data compiled by the Bureau of Customs.

Wholesale Prices, February 1960

WHOLESALE PRICES, FEBRUARY 1960:

In February this year wholesale prices for edible fishery products (fresh, frozen, and canned) at 121.8 percent of the 1947-49 average were about unchanged from the preceding month. Increases in wholesale fresh and frozen shrimp prices were just about offset by lower prices for drawn and filleted haddock. From February a year ago to this February over-all wholesale fishery products prices were down by 8.9 percent due to lower prices for a majority of the items that make up the index, particularly haddock and shrimp.

The weaker market for haddock at Boston, which has been evident during past few months, continued into February this year. Landings of both large and small haddock through February this year were lower than in the same period a year ago, but the sharply higher inventories of frozen haddock fillets and other fillets continued to depress the market for fresh fish at New England ports. The drawn, dressed, and whole finfish subgroup index declined one percent from January to February this year due to a 5.1-percent drop in the price for large drawn haddock and a drop of about one cent a pound for frozen dressed halibut. These declines were just about offset by increases in wholesale prices for frozen king salmon, round whitefish, and yellow pike. Compared with February a year ago, the subgroup index was down by 14.9 percent due to lower wholesale prices for all the items that make up the group. The sharpest price declines occurred in drawn haddock (down 43.2 percent) and in dressed halibut (down 12.0 percent).

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, February 1960 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($)		Indexes (1947-49=100)			
			Feb. 1960	Jan. 1960	Feb. 1960	Jan. 1960	Dec. 1959	Feb. 1959
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					121.8	121.9	122.7	133.7
Fresh & Frozen Fishery Products:					134.9	135.1	136.4	157.9
Drawn, Dressed, or Whole Finfish:					147.2	148.7	154.8	170.9
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.12	.13	120.9	127.4	163.9	212.8
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.29	.30	90.3	93.8	96.4	102.6
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.77	.77	172.5	171.9	171.3	173.0
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.75	.65	185.9	159.9	115.3	190.9
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.68	.80	136.6	161.9	177.0	161.8
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.73	.71	170.0	166.5	138.4	173.5
Processed, Fresh (Fish & Shellfish):					134.5	135.8	134.6	151.1
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.41	.44	139.5	148.0	166.7	205.9
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.71	.68	112.2	106.6	101.9	145.3
Oysters, shucked, standards	Norfolk	gal.	6.63	7.00	163.9	173.2	173.2	148.5
Processed, Frozen, (Fish & Shellfish):					110.2	107.9	106.8	137.4
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.38	.38	98.1	98.1	98.1	108.6
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.31	.31	97.3	97.3	97.3	131.8
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.28	.27	110.8	108.8	108.8	124.9
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.68	.65	104.1	100.3	98.4	133.8
Canned Fishery Products:					103.8	103.8	103.8	98.8
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	24.50	24.50	127.8	127.8	127.8	116.1
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	10.80	10.80	77.9	77.9	77.9	79.3
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	cs.	8.00	8.00	93.9	93.9	93.9	86.6
Sardines, Maine, keyless oil, No. 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.75	8.75	93.1	93.1	93.1	87.5

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

Fresh processed fish and shellfish wholesale prices in February 1960 were down 0.6 percent from the preceding month. An increase of 5.3 percent in fresh shrimp prices at New York City was more than offset by a drop of 5.7 percent in fresh haddock fillet prices and a 5.4-percent drop in fresh shucked oyster prices. A decline of 11.0 percent occurred in the subgroup index from February last year to February this year due to sharp price drops of 32.2 percent for fresh haddock fillets and 22.8 percent for fresh shrimp. However, during the same period shucked oyster prices rose 10.4 percent.

The wholesale price index for frozen processed fish and shellfish in February 1960 was higher by 2.1 percent as compared with January this year. Frozen shrimp prices increased (about 3 cents a pound) and frozen ocean perch fillets were up about 1/2 cent a pound in February as compared with the preceding month. From February last year to February this year the subgroup index was down 19.8 percent, due primarily to a 26.2-percent decline in frozen haddock fillet prices and a 22.2-percent drop in frozen shrimp prices. In addition, frozen flounder and ocean perch fillets were lower by 9.7 percent and 11.3 percent, respectively.

From January to February this year wholesale canned fish prices were unchanged. The index for the canned subgroup has moved over a narrow range of less than 1 percent since August 1959. As compared with February a year ago, primary canned fish prices in February this year were higher by 5.1 percent. In February 1960, prices were up 10.0 percent for canned pink salmon, 6.4 percent for Maine sardines, and 8.4 percent for California sardines. However, canned tuna prices in February this year were down 1.8 percent from February a year ago. As of the end of February this year, canned tuna was the principal canned fish with substantial stocks. Stocks of Maine sardines were light. Stocks of both California sardines and Pacific salmon were extremely light with 5-8 months remaining before new packs become available.

Virginia

FISH EGGS AND LARVAE SURVEYS IN OCEAN WATERS CONTINUED:

The biologists of the Virginia Fisheries Laboratory, Gloucester Point, aboard the M/V Pathfinder continued surveying the ocean waters off Virginia's coast for fish eggs and larval fishes during January 1960.

The biologists reported large numbers of what appeared to be larval menhaden in the water 30-40 miles offshore. On the first cruise to ocean waters in December 1959, large numbers of fish eggs were collected and an abundance of larval flounders less than $\frac{1}{8}$-inch long. Hake larvae were also abundant, but only one larval croaker was collected. One of the puzzles which the Laboratory is trying to solve is the location of the spawning grounds and movements of croakers, spot, and other important fish.

Water temperatures off the coast in the third week of January were between 40° and 45° F. and surface temperatures in Virginia eastern shore inlets were about 34° F.

Note: Also see Commercial Fisheries Review, February 1960 p. 33.

TWO OF 1959'S "TWENTY BEST" SANDWICHES FEATURED FISH

Since 1956, the National Restaurant Association and the Wheat Flour Institute have sponsored an annual National Sandwich Idea Contest and "August is Sandwich Month" promotion. More than 800 entries were received in 1959 from restaurant owners and employees. From these the 20 best new ideas for sandwich combinations were picked and presented at the National Restaurant Convention at the Navy Pier in Chicago. The sandwich ideas were scored on the basis of practicability, suitability to various types of restaurant service, appearance, newness, and flavor. Two of 1959's "twenty best" sandwiches featured fishery products, whereas 5 of the 20 featured fish in 1958.

International

PACIFIC HALIBUT COMMISSION

HALIBUT REGULATIONS FOR 1960:

Fishing for halibut will begin May 1 in all North Pacific areas except in waters west of the Shumagin Islands, according to the recommendation of the International Pacific Halibut Commission to the governments of the United States and Canada. The 1960 regulations are almost the same as those in effect in 1959. In light of the scientific findings and discussions with the industry, the Commission is recommending to the two Governments the following regulations for the 1960 season:

Fishing areas shall be the same as in 1959: Area 1A--south of Heceta Head, Oreg.; Area 1B--between Heceta Head and Willapa Bay, Wash.; Area 2--between Willapa Bay and Cape Spencer, Alaska; Area 3A--between Cape Spencer and Shumagin Islands; Area 3B--waters west of Area 3A, including Bering Sea.

Opening date for halibut fishing in all areas except Area 3B shall be May 1 (at 6:00 a.m.).

Opening date for halibut fishing in Area 3B shall be at 6:00 a.m. April 1.

In Area 1A there shall be one fishing season, without catch limit, extending from May 1 to 6:00 a.m. October 16 or to the closure of Area 3A, whichever is later.

In Area 3A there shall be one fishing season, with a catch limit of 30 million pounds, commencing on May 1 and terminating at the time of attainment of the catch limit.

In Area 3B there shall be one fishing season, without catch limit, extending from April 1 to October 16 or to the closure of Area 3A, whichever is later.

In Area 2 there shall be two fishing seasons throughout the entire area.

In Area 2 the catch in the first season shall be limited to 26.5 million pounds. The second fishing season in Area 2 shall begin at 6:00 a.m. September 11, for a period of 7 days without catch limit.

In Area 1B there shall be two fishing seasons, identical in duration to those in Area 2, and without catch limits.

The grounds in Area 2 off Masset at the north end of Queen Charlotte Islands and off Timbered Islet off the west coast of Prince of Wales Island in southeastern Alaska, which were closed for a number of years prior to 1958, shall be open to fishing in 1960 as in 1959.

The Halibut Commission is responsible to Canada and the United States for the investigation and regulation of the halibut fishery of the northern Pacific Ocean and Bering Sea. Its specific function is the development of the stocks of halibut to levels that will permit the maximum sustained yield, and its decisions regarding regulations are based upon the findings of its scientific staff.

During the past 28 years of Commission management, there has been progressive improvement of the stocks and an increase in annual yield. The annual catch which had declined to 44 million pounds in 1931, the year before regulation, has averaged more than 66 million pounds during each of the past four years. The 1959 catch of 71.5 million pounds was worth nearly $13 million at the vessel level.

The International Pacific Halibut Commission concluded its Thirty-Sixth Annual Meeting late in February at its headquarters at the University of Washington, Seattle, with Chairman William M. Sprules of Ottawa, Ontario, presiding.

Other members of the Commission are Andrew W. Anderson of Washington, D. C., Vice Chairman, and Mattias Madsen and William A. Bates representing the United States; and Harold S. Helland and Richard Nelson representing Canada.

Andrew W. Anderson of Washington, D. C., was elected Chairman and Dr. William M. Sprules of Ottawa, Ontario, Vice Chairman for the ensuing year.

The Commission reviewed the past year's fishery and the research conducted by its scientific staff at its meeting. It dealt with administrative matters and approved a research program for 1960. In the course of its sessions the Commission conferred not only with its staff, but also with representatives of the halibut fishermen's, vessel owners' and dealers organizations, and with its Industry Advisory Group consisting of representatives of each of the foregoing segments of the industry. The scientific findings and all suggestions for regulations in 1960 were discussed at these meetings. In addition the Commission also conferred with representatives of the federal enforcement agencies of both countries regarding their plans for expansion of such activities on different sections of the Pacific Coast.

The Commission also announced that the 1961 Annual Meeting will take place at Prince Rupert, British Columbia.

Since in the past the United States and Canadian governments have accepted the recommendations of the Commission without changes, it is fairly certain that the 1960 regulations as recommended by the Commission will be approved by the two governments.

FOOD AND AGRICULTURE ORGANIZATION

U. S. PROPOSALS FOR WORLD CONFERENCE ON TUNAS AND NUTRITIVE VALUE OF FISHERY PRODUCTS ACCEPTED:

The United States Delegation to the Tenth Session of the FAO Conference (held in Rome, October 31-November 20, 1959) reports that:

"The Conference recognized the value of holding world conferences in various fishery fields as a potent means of furthering the objectives of FAO; the reports of these conferences of experts formed the basis for creative action, and determined the direction that future activities should take.

International (Contd.):

"Two major proposals by the United States Delegation were accepted and written into the report of the Conference. The first proposal, dealing with a world conference on the biology of tunas, was received favorably by all delegates, and the suggestion was made that the conference be held in Hawaii, because it is a major center for research of tunas, and has excellent facilities for a conference. In the absence of specific authority for the United States Delegation to issue an invitation, the time and place of this conference were left to the Director General to work out, in consultation with interested governments. The other proposal, dealing with a symposium on the nutritive value of fishery products, was also received favorably, and the Committee has requested the Director General to go into the possibility of organizing this symposium as a joint activity of the Fisheries and Nutrition Divisions, subject to the availability of funds."

MARINE OILS

ESTIMATED WORLD PRODUCTION, 1957-60:

World production of marine oils (includes whale and sperm whale oils and fish and fish-liver oils) in 1960 is expected to be about 3 percent above 1959 mainly because of a larger crop of whale oil from the 1959/60 Antarctic whaling season. Catch goals announced by the nations participating in Antarctic whaling total 17,500 blue-whale units, an increase of 2,200 units over 1958/59. The production of sperm oil this year is not expected to rise, since prices received for the 1959 production were relatively low.

Table 1 - Estimated World Production of Marine Oils, 1957-60

Marine Oils	1960 1/	1959 2/	1958	1957
	(1,000 Short Tons)			
Whale	440	415	435	440
Sperm whale	125	125	135	110
Fish (including liver)	500	490	470	485
Total	1,065	1,030	1,040	1,035

1/Forecast. 2/Partly forecast.

Fish oil production may be up slightly if the Norwegian winter and spring herring catch in 1960 recovers from the low levels of 1958-59. (Foreign Crops and Markets, U. S. Department of Agriculture, January 28, 1960.)

NORTH PACIFIC FUR SEAL COMMISSION

THIRD ANNUAL MEETING:

The North Pacific Fur Seal Commission adjourned its third Annual Meeting on January 27, 1960. The meetings were marked by a spirit of cooperation among the four participating delegations from Canada, Japan, U. S. S. R., and the United States. Each country on the Commission is represented by a Commissioner and Advisers. The Commission, which was established under the provisions of the 1957 Interim Convention on Conservation of the North Pacific Fur Seals, signed at Washington on February 9, 1957, had opened its third Annual Meeting in Moscow on January 25.

The Commission has as its major responsibility investigation of the fur-seal resources of the North Pacific Ocean. The objective of this investigation is to determine the measures which will make possible the maximum sustainable yield from these resources, with due regard for their relation to the productivity of other living marine resources in the area. In accordance with plans developed by the Commission at its first and second meetings, research agencies of the four Governments are carrying on research at sea, while United States scientists carry on research on the breeding grounds on the Pribilof Islands in the Eastern Bering Sea, and Soviet scientists do similar work on the Commander Islands in the Western Bering Sea, and on Robben Island in the Okhotsk Sea. The investigations are concentrated on dynamics of the fur-seal populations, distribution and migration at sea, feeding habits, and harvesting methods.

In the course of its deliberation, the Commission reviewed the results of the 1959 scientific research programs of the four Member Governments--Canada, Japan, the Union of Soviet Socialist Republics, and the United States--regarding the fur seals of the North Pacific Ocean.

It particularly noted the favorable growth of the Robben and Kommondorski herb and the progress being made on the Pribilof herd management program introduced in 1957 to develop the maximum sustainable yield from that herd. The 1959 research work revealed that young

International (Contd.):

tagged seals from the Pribilof Islands occurred in some numbers on the Commander Islands. A few Pribilof tagged fur seals even went as far afield as Robben Island west of Sakhalin. The Commission also approved a coordinated plan for research during the 1960 season.

The Japanese Commissioner was elected Chairman of the Commission to serve through the next Annual Meeting and the U. S. S. R. Commissioner was elected Vice-Chairman.

It was agreed that the next Annual Meeting of the Commission would be held in Tokyo beginning January 30, 1961.

Investigations at sea will begin in early February 1960 on both sides of the Pacific. Investigations at the rookeries will begin in the early summer as the seals arrive at the end of their annual migration to the breeding ground.

Under the provisions of the Interim Convention, commercial harvesting of seals at sea is prohibited. All harvesting is done on the breeding grounds under the control of the United States on the Pribilof Islands, and under the control of the Soviet Government on Robben Island and the Commander Islands.

Note: See Commercial Fisheries Review, February 1959, p. 46.

ORGANIZATION FOR EUROPEAN ECONOMIC COOPERATION TO BE REORGANIZED

At the regular Ministerial Meeting of the Organization for European Economic Cooperation and also at special meetings held in Paris, January 12-14, 1960, an agreement was reached by the 20 Organization for European Economic Cooperation governments to replace the OEEC with a new organization in which the United States and Canada could participate as full members. Under the present organization, both are associate members.

Upon his return to Washington, Under Secretary of State Douglas Dillon, who represented the United States at the meetings, issued the following statement:

". . . At these special meetings the 20 governments reached decisions which are of great potential importance for the future of economic cooperation in the Free World. Agreement was reached to work together for the establishment of a successor organization to the OEEC (Organization for European Economic Cooperation) in which the United States could participate as a full member and which would facilitate cooperation between the industrialized nations of the Free World in meeting the major economic problems which will face the world during the coming decade.

"As a result of the Paris decisions we also have reason to expect that a serious and successful effort will now be made to solve the problems of European trade connected with the European Economic Community, and the European Free Trade Association--the Six and the Seven. We have obtained assurances that any solution will take full account of the interests of the United States and other countries in accordance with the principles of the General Agreement on Tariffs and Trade.

"Also during the Paris meetings the governments of a number of capital exporting nations agreed to consult together on their efforts to provide development assistance to the less developed areas. This group will probably hold its first meeting in Washington in the near future."

Australia

GOOD CATCHES ON NEW SHRIMP GROUNDS REPORTED:

Australia's chartered exploratory fishing vessel Challenge towards the end of 1959 reported the discovery of a shrimp fishing area off Cape Moreton. A report from the Challenge, covering work during the third week of November 1959, says:

Shrimp were obtained in all depths between 20-32 fathoms, the most productive depths being 27-32 fathoms. In over 32 fathoms shrimp were obtained, but the ground carries large quantities of starfish.

Australia (Contd.):

One drag on November 19 of 60 minutes yielded 70 pounds of king shrimp in a depth of 32 fathoms. Size range was from 3-9 inches and averaged 6-7 inches (heads on). Drags were made out to 80 fathoms but no shrimp were found.

The area tested extends at least 15 miles from northeast to northwest of Cape Moreton.

The Challenge later fished the area in company with 7 trawlers which had had difficulty in finding the ground. Catches for those vessels ranged from 400-700 pounds of king shrimp for the night. Some 170 pounds of king shrimp were taken by the Challenge using an American balloon trawl.

Leaving Cape Moreton, the Challenge trawled east of Moreton, Stradbroke, and South Stradbroke Islands in depths to 80 fathoms. Only a small quantity of shrimp was taken. The area showed reasonably good trawlable ground which could hold shrimp.

Between November 28 and December 8 the Challenge worked from Southport to Tweed Heads, Byron Bay, and Ballina.

The bottom between Southport and Tweed Heads seemed unsuitable for trawling, but off Ballina, in 44-45 fathoms, 15 pounds of king shrimp were obtained. It was the best show of king shrimp found in over 40 fathoms. It was intended to work the area at night. The ground appeared to be hard. (Australia Fisheries Newsletter, January 1960.)

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RESTRICTIONS ON IMPORTS OF SOME FISHERY PRODUCTS REMOVED:

In another step towards normal world trading, Australia has removed rstrictions on imports of fresh, chilled, and frozen fish from the dollar area. Australia makes the fourth country (others are Italy, United Kingdom, and France) which liberalized restrictions on the imports of some fishery products from the dollar area during 1959 or early 1960. In November 1959, Australia lifted restrictions on imports of fresh and frozen salmon.

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SHRIMP INDUSTRY:

Although the Australian Government and the fishing industry are interested in expanding both the shrimp catch and exports, expansion of the shrimp industry has been slow. At an estimated catch level of 6.5 million pounds (heads on) in the fiscal year ending June 30, 1960, the landings would be down slightly from the preceding fiscal year total of 6.8 million pounds.

Fishing Fleet: There are about 150 vessels engaged full time in the Australian shrimp fishery. These vessels range in size from 30-60 feet in length with motors up to about 350 horsepower. During the peak shrimp fishing season, the fleet increases to about 200 vessels.

Ex-Vessel Prices and Costs of Production for Export: Prices being paid to the vessels for exportable sizes of shrimp (mostly 21-25 and 26-30 count) were from 39-42 U.S. cents a pound. Catches of shrimp are sold ungraded. Total costs for processing shrimp for export amount to about 23-24 cents a pound, including all costs to point of shipment other than storage at point of export. This latter cost, if incurred, would increase the total cost by 1 or 2 cents a pound. Additional costs to the distributor's level in the United States would include ocean freight, insurance, handling, storage, and broker's commission.

Export Trade in Shrimp: Australian statistics do not list the value of shrimp exports as those exports are combined with exports of other shellfish in the export statistics. The Australian Fisheries Division of the Department of Primary Industry estimates that exports for the fiscal year ending June 30, 1960, will be about 450,000 pounds of headless shrimp, or about 5 percent higher than the 1958/59 fiscal year exports of 427,000 pounds.

Export Controls and Taxes: There are no taxes or other export restrictions imposed on the shrimp exported from Australia. Under the Exports Regulations, shrimp must be processed in an establishment approved by the Government. The regulations prescribe certain sanitary requirements, freezing times, and maximum temperatures for freezing and storage. Inspectors for the Government insure compliance with the regulations.

Table 1 - Australia's Landings and Value of Heads-On Shrimp by Species, 1956/57-1958/59

Fiscal Year 1/	Species of Shrimp						Total		
	Green Tail	School	Tiger	King	Banana	Other	Quantity	Value 2/	
	(1,000 Lbs.)							£A	US$1,000
1958/59	680	2,092	679	2,280	974	46	6,751	943,000	2,112
1957/58	832	970	627	1,539	647	37	4,647	796,618	1,784
1956/57	693	1,476	303	1,780	793	30	5,076	851,423	1,907
1955/56	511	2,070	336	2,092	1,138	-	6,148	763,267	1,710

1/Fiscal year July-June.
2/Australian pounds converted at rate of US$2.24=1 £A.

Australia (Contd.):

Table 2 - Australia's Exports[1/] of Headless Shrimp, Fiscal Years 1956/57-1958/59

Country	1958/59	1957/58	1956/57
	(1,000 Lbs.)		
United States[2/]	386	267	232
New Guinea	35	23	54
Other	6	7	22
Total	427	297	308

1/Mostly king and banana shrimp.
2/Includes Hawaii.

Summary: In view of the slow rate of expansion of the Australian shrimp fishery, it appears unlikely that shrimp exports to the United States will exceed the present level for some time in the future. (U. S. Embassy in Canberra, report dated December 11, 1959.)

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TUNA FISHERY HAS GOOD SEASON:

To December 10, 1959, one Australian firm with canneries had received about 1,600 metric tons of tuna. The catch for the season came in bursts and the firm used more tuna in a shorter time than ever before. The new clipper Estelle Star was believed to be the top boat. Tuna were apparently moving south, being taken off Cape Howe. Some yellowfin showed up in the Eden area--300 boxes taken in Lakes Entrance area, were about 15-lb. fish.

The tuna clippers Fairtuna and Tacoma returned to South Australia, reportedly with 20 tons of tuna. Some more of their tuna was held by another Australian firm (Sydney) which said they would merchandise it. An Australian firm was paying 5d. a pound ($93 short ton) for tuna 15-80 pounds and 4d. a pound ($75 ton) for other sizes for landings at Pt. Lincoln or Adelaide. (Australia Fisheries Newsletter, January 1960.)

Brazil

NEW SHORE-BASED WHALING STATION ESTABLISHED:

A new Brazilian land-based whaling station is being installed in the northern part of the State of Rio de Janeiro, about 500 miles north of the whaling station at Imbituba, in the State of Santa Catarina. The station will operate from May to November, or during the same periods as other Brazilian land-based whaling stations. According to information received from the International Whaling Commission in London, the estimated production of the new station will be 390 blue-whale units, derived from minke and sperm whales.

British Guiana

EXPANSION OF SHRIMP FISHERY CAUSES CONCERN:

During the latter part of 1959 an increasing amount of attention was given by United States and Venezuela shrimp fishermen to the establishment of operations in British Guiana.

At the present time there is a corporation in British Guiana that operates two vessels, and in addition accepts the catches of approximately 27 additional vessels (principally from Florida and Texas) fishing off British Guiana.

During the past 10 months this corporation has forwarded to the United States market 1.1 million pounds of frozen shrimp valued at about US$500,000.

There are strong indications that a number of additional trawlers that have operated out of Venezuela are now seriously interested in moving to new grounds because of various difficulties with the Venezuelan Government and merchants regarding their operations.

There are applications for permission to fish out of British Guiana originating from this Venezuelan group for about 12 additional trawlers, and it also appears that more trawlers are gradually coming in from Florida, probably about 20 vessels.

The Department of Fisheries of British Guiana is extremely concerned that this influx of vessels could well cause a serious situation because of the large number of very young fish caught during shrimp fishing and because the fish are discarded thereby creating a serious waste of potential fish in British Guiana waters. Special concern is also caused by the shrimp vessels catching a large quantity of young red snappers which

British Guiana (Contd.):

are an important source of food and income to that country.

Fishing vessels operating out of British Guiana come under local regulations which require owners or masters to accept Government personnel to accompany vessels on voyages whereby technicians can observe at first hand methods and operations, and more particularly evaluate the proportion of fish being discarded from shrimp catches. (United States Embassy in Georgetown, February 2, 1960.)

British North Borneo

TUNA FISHING COMPANY ESTABLISHED BY JAPANESE:

A Japanese company has decided to establish a joint tuna fishing company in British North Borneo with its base on a small island 60 miles east of Tawau In February 1960 the Japanese company's freezership Guiyo Maru (3,800 tons) was expected to sail for Borneo. In the beginning, five skipjack boats will be used to catch an estimated 8,000 tons a year. The cannery, which will be set-up in conjunction with the fishing operation, is expected to pack 100,000 cases the first year. The capital of the new company will be some $638,889. (Fisheries Economic News, January 30, 1960.)

Cameroun[1/]

NEW NATION HAS PROMISING FISHERIES RESOURCES:

The fishing industry has just recently begun to be exploited in Cameroun. In spite of a relatively limited coast line (about 186 miles), Cameroun's maritime fishing industry looks quite promising, for the country is well endowed with numerous salt-water lagoons and the huge estuary of the Wouri River at Douala. By the end of November 1959 exports had already amounted to 422 tons.

Fishing in Cameroun is practiced by about 1,500 natives composing two distinct groups, those who work for European-owned fishing companies and independent fishermen. The former fish by trawling, mostly for a type of sea perch called "Otolithes." Other fish caught in Cameroun waters are sole, catfish, dolphin, shark, ray, gurnard, hogfish, mullet, conger eel, spiny lobster, shrimp, crab, tuna, barracuda, seapike, and carp. The independent fishermen use pirogues and fish with hand lines and cast net.

More fish is being eaten locally in the south of Cameroun each year, which is usually dried and smoked before being marketed. The fresh fish market is primarily controlled by the European-owned companies.

It is believed that as Cameroun turns more and more to its own resources, now that it is independent, one of the industries which will expand is the fishing industry. (United States Embassy in Yaounde, February 15, 1960.)

1/Became an independent state January 1, 1960, and is located in the Gulf of Guinea. Formerly was part of French Equatorial Africa and a United Nations Trusteeship under French rule.

Canada

BRITISH COLUMBIA FISH MEAL PLANTS CLOSED DUE TO POOR MARKET:

In mid-December 1959, the independently-operated fish meal and oil plants in British Columbia announced that they would not reopen their plants following the Christmas holidays due to the depressed world market for fish meal and oil. As of the end of January this year, the reduction plants remained closed with the exception of one fishermen's cooperative in Prince Rupert.

The usual spring opening of the 1959 herring fishing season in British Columbia was delayed until early October due to a dispute between the plant operators and the fishermen's union over the ex-vessel price for herring to be used for reduction. The fishermen's union had demanded a 14.6-percent increase over the 1958 price of $13 a ton. The fish meal and oil plants rejected this offer and the union finally accepted a two-year contract at the 1958 ex-vessel price. Herring fishing began on October 6, 1959. In spite of the short fishing season, landings of herring through December 19, 1959, amounted to 166,251 tons as compared with 174,576 tons landed during the normal-length season of 1958 up to that same date.

Spokesmen for the British Columbia herring reduction industry in replying to protests by the fishermen's union point out that when the original contract was signed (probably 1958 or earlier), herring meal was selling at about $162 a

Canada (Contd.):

ton and that when the shutdown was announced in mid-December 1959, prices had dropped to about $115 a ton. During that period world oil prices also declined. The spokesmen attributed the drop in prices for fish meal and oil to the sharp increase in fish meal production by Peru, the bumper crop of fish meal and oil produced in South and South-West Africa, plus increased use of vegetable oils. The British Columbia producers claim that they cannot compete with the low-priced fish meal from Peru (about $110 a ton f.o.b. U.S. port in January 1960). In rebuttal to statements by the fish meal and oil plant spokesmen, the union has accused the companies of "inefficient production methods" and also the Canadian Government of failure to broaden the market for herring. The company spokesmen claim that high production and labor costs prohibit British Columbia from producing canned, pickled, and smoked herring products.

The British Columbia fishermen were reported to be looking for aid from the Provincial and Federal Governments to pressure the plant operators to resume production as well as to consider granting a subsidy to permit economic operation.

In the 1959 season through December 19, British Columbia plants produced 30,031 tons of fish meal and 4,328,220 Imperial gallons of fish oil as compared to 31,337 tons of fish meal and 3,955,508 gallons of fish oil through the same date in 1958. (United States Consul in Vancouver, January 22, 1960.)

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BRITISH COLUMBIA SHUCKED OYSTER PRODUCTION HIGHER IN 1959:

The British Columbia shucked oyster production in 1959 amounted to 74,632 Imperial gallons (89,558 U. S. gallons), higher by 18.8 percent than the 1958 production of 62,834 gallons. Prices to producers in December 1959 were as follows for Imperial measures: half-pints, C$0.33-0.40; pints, $0.65-0.80; quarts, $1.00-1.65; gallons, $4.00-5.25.

Table 1 - British Columbia's Oyster Meats Production, 1958-59

Year	Imperial Measures					
	Half-Pints	Pints	Quarts	Gallons	Other	Total Gallons
1959	390,837	13,158	24,849	38,845	3,503	74,632
1958	313,889	21,414	18,492	32,675	3,241	62,834

Note: Imperial gallon = 1.2003 U. S. gallons.

Retail prices in Vancouver on January 15, 1960, were C$0.52-0.55 for an Imperial half-pint container.

Note: Also see Commercial Fisheries Review, March 1959, p. 61.

Chile

"LANGOSTINO" INDUSTRY:

The most important shellfish landed in Chile is the "langostino," or salt-water crawfish (Galatheus monodon). This shellfish is not closely related to either the shrimp or spiny lobster, but is considered by the United States fishery trade to be a "spiny lobster-type meat" and is classified as such in U. S. Customs records.

The "langostinos" are caught in depths ranging from 50 to 100 fathoms, and the fishing season is from May to December. Landings of about 12.6 million pounds in 1956 increased to 25.1 million pounds in 1957, and to 28.3 million pounds in 1958.

The fishermen receive 65 U. S. cents a case of 13 kilos, or about 2.27 U. S. cents a pound for the whole "langostinos." Observers state that the recovery from whole "langostinos" in terms of the cooked, peeled, and deveined tail portion exported to the United States is only about 15 percent.

Exports to the United States of the cooked, peeled, and deveined "langostino tails" began in 1955 (about 5,000 pounds) and climbed to 441,423 pounds in 1956, and were almost 1 million pounds in both 1957 and 1958, according to U. S. Customs records.

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SHRIMP INDUSTRY:

Most of Chile's shrimp catch is made in cold deep water (100 fathoms or more) and are sold in Chile as "camarones." The shrimp run about 120 to the pound heads off and are caught usually from May to December. According to estimates, the landings in 1959 amounted to about 750,000 pounds, or about 11 percent lower than the 842,000 pounds reported for 1958. Landings both in 1958 and 1959 were about three times the landings made in 1956 and 1957.

As of December 1959, 15 vessels were reported to be engaged in the shrimp fishery. These shrimp fishing vessels, of 20-50 metric tons hold capacity, range in size from 44 to 80 feet in length and are powered by 100 to 300 German-made Diesel engines.

Chile (Contd.):

Shrimp processing plants purchase heads-on shrimp from the vessels at $1.10 per case of 15 kilos (about 3.33 U. S. cents a pound). Based on a headless shrimp cost of about 10 U. S. cents a pound, other costs of deveining, cooking, freezing, packaging, and transportation bring production costs up to about 42 U. S. cents a pound.

Exports from 1956-59 were all to the United States and amounted to 163,636 pounds in 1958, 45,340 pounds in 1957, and 84,027 pounds in 1956, according to U. S. Customs records.

The 1959 budget of the Corporacion de Fomento de la Produccion (Government Development Corporation) included US$500,000 for use in facilitating the purchase of fishing boats. In October 1959, the Government announced that the Ministry of Agriculture would import motors and fishing equipment to be sold on credit to fisheries cooperatives in the Provinces of Tarapaca and Antofagasta. The Government hopes to extend credit to other fisheries districts in the future. A United States citizen proposes to establish a shipyard at Iquique for building fishing vessels of native wood. The proposed vessels will be combination trawler-purse seiners about 66 feet in length with a hold capacity of 100 tons.

There are no taxes on shrimp exports, but the processing companies are taxed. A letter of credit is required to obtain an export license. Inspections for quality are made at the plant and the point of shipment. (United States Embassy in Santiago, December 17, 1959.)

Cuba

GOVERNMENT ASSUMES CONTROL OF FISHING COOPERATIVES:

In a brief Resolution published in the Cuban Official Gazette No. 9 of January 14, 1960, the INRA (National Agrarian Reform Institute) formally assumed control over all the Cuban fishing cooperatives.

This confirms previous reports that the INRA intended to enter more actively into the fisheries field. However, no official announcement has been made concerning the reported possibility that the National Fisheries Institute (Instituto Nacional de la Pesca) would be completely absorbed by the Fisheries Department of the INRA.

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RESOLUTION ESTABLISHES MAXIMUM PRICES FOR MANY FISH AND SHELLFISH:

The Cuban Ministry of Commerce Resolution No. 3, which appeared in Official Gazette No. 6 of January 11, 1960, established maximum prices to the public on a number of listed fish and shellfish products.

The National Fisheries Institute (Instituto Nacional de la Pesca) of the Cuban Maritime Development Office previously had established a new ceiling price to be paid to fishermen of US$12 per case of 60 pounds for whole spiny lobster or for 20 pounds of spiny lobster tails, which was to become effective retroactively to June 15, 1959. This decision, published in Official Gazette No. 207 of November 2, 1959, is being hotly contested by the spiny lobster packing plant owners who may be obliged thereby to pay the difference between the new price of $12 per case and the formerly-agreed price of $11.50 per case, retroactively to June 15, 1959.

The stated purpose of these pricing regulations are said to be to improve the economic position of the Cuban fishermen as a class. The regulations militate quite definitely against the packing plant owners. The Cuban Government claims that the consuming public will also benefit from these pricing measures.

Recently the INRA (National Agrarian Reform Institute) was reported to have expropriated approximately 300 fishing vessels in Las Villas Province. The INRA is proceeding to establish fishermen's cooperatives and is operating ice plants and "peoples stores" in that area. The INRA is also reported to have intervened several packing firms in Manzanillo, Oriente, which will henceforth be op-

Cuba (Contd.):

erated as cooperatives. A boatyard in Manzanillo is also reported to have launched the first fishing boat constructed for the INRA.

The INRA apparently has not yet felt it expedient to attempt to expropriate fishing concerns in the Habana area where it might be expected that the INRA would encounter considerable resistance, especially on the part of the Habana fishing fleet skippers who display no intentions of willingness to turn over their privately-owned boats to any cooperative fishing organizations. INRA has reportedly paid in cash for all the fishing facilities it has thus far expropriated, the United States Embassy in Habana reported on January 18, 1960.

Note: See Commercial Fisheries Review, December 1959, p. 76.

Denmark

EXPERIMENTS ON FRESH FISH SHIPMENTS PLANNED:

Two fish exporters located in Esbjerg, Denmark, have been selected by the Danish Ministry of Fisheries to carry out experimental shipments of various kinds of fresh fish to France and Italy. The project is being financed by a grant of 25,000 kroner (US$3,621), and will be supervised by experts from the Ministry's research laboratory.

The project is comprehensive, and will include tests of various packing materials, insulation materials, and market researches of the demand for the fresh fish in the area to which they are shipped. The shipments will take place over a period of several months so that the effect of air temperature on the fish can also be taken into account. The first shipment is scheduled to go to Boulogne, France, states a United States Embassy dispatch from Copenhagen dated January 29, 1960.

Egypt

EQUIPMENT FOR NEW SARDINE CANNING PLANT RECEIVED:

According to press reports from Egypt, the Japanese equipment for the sardine canning plant to be set up at Damietta arrived early in February at Port Said. The reports state that the cost of setting up the new canning plant will be about 100,000 Egyptian pounds (about US$284,000 at official exchange rate) and that the plant will be in operation in September 1960. The canned sardines produced by the plant are destined for export, the United States Consul at Port Said reported on February 2, 1960.

French West Africa

TUNA FISHERY TRENDS, DECEMBER 1959:

The 1959/60 tuna fishing season off French West Africa began on November 1, 1959, one month earlier than in 1958. This will be the fifth tuna fishing season in that area and landings are expected to be up sharply from the 1958/59 season.

A Senegalese delegation, headed by the Director of Cabinet of the Minister of Rural Economy, participated on September 30, 1959, in the Paris meeting of the Tuna-Fish Interprofessional Committee. It submitted the 1959/60 season's program which involves a catch of 16,000 metric tons of tuna (about 7,000 tons landed in 1958/59 season) and which was agreed to according to official sources. Of that quantity, 7,500 tons are to be processed in the 5 local canneries (against 4,500 tons in 1958/59), 2,500 will be frozen in the Dakar area and shipped to French mainland canneries, and 6,000 tons are due to be frozen in Dakar for sale in foreign markets. In connection with the latter, the Minister of Rural Economy mentioned in a press interview late in November that a United States tuna canning firm had made "extremely interested proposals regarding the United States market. . .with a possibility of offering an outlet for as much as 10,000 tons annually." He also referred to a contract for the supply of 3,000 tons of tuna which had been placed

French West Africa (Contd.):

by Italy, which groups the tuna clippers of France and Senegal.

The possibility of substantially expanding the tuna canning facilities in the Dakar area has been under consideration. A mission of three top executives, two representing France's fishing interests and the third the Caisse Centrale de Credits Cooperatifs pour la Peche, came to Dakar in October to study the possibility of establishing a tuna cannery with a capacity of 1,000 metric tons a month. If this project materializes, Dakar would have the largest such factory in French West Africa and, reportedly, of all the European Economic Community (EEC) countries.

The 1959/60 16,000-ton tuna catch quota reportedly represents half of the expected total for the area. The Senegalese Government is most anxious to develop the tuna resources, the United States Consul at Dakar reported on December 17, 1959.

German Federal Republic

FOUR STERN-FISHING TRAWLERS ORDERED BY FISHING COMPANY:

West Germany's largest ocean fishing company has contracted with Bremerhaven shipyards for seven Diesel-powered trawlers. Four of the new vessels will be of the stern-fishing type. Two of the stern-fishing trawlers will be about 219.8 feet in length with a 36.1-foot beam. Both of these vessels will be equipped for freezing fish and for fish meal production.

The other two stern-fishing trawlers, reportedly, will differ significantly in construction and method of operation from the usual type of stern-fishing trawler. The other three conventional trawlers will be built for the herring fishery. All seven vessels will be placed in service in 1960 and 1961. (Fiskets Gang, January 14, 1960, Norwegian trade paper.)

Greece

AGREEMENT REACHED WITH PORTUGAL FOR CONSTRUCTION OF TWO FACTORYSHIPS:

The Greek Government announced late in 1959 that an agreement had been reached with Portugal for the construction of two factoryships. The vessels will be 84 meters (about 256 feet in length) and will be paid for from the proceeds of 5,200 metric tons of Greek tobacco sold to Portugal. The vessels are to be sold to two Greek fishing companies on very liberal terms. The value of each factoryship is estimated to be about US$1,850,000. The contract with the Greek fishing companies calls for repayment of the loans in eight annual installments.

The contract terms, which call for very little actual capital outlay on the part of two Greek fishing companies who will operate the vessels, has been the cause of some criticism on the part of the Greek fishing industry. (Aleia, December 17, 1959.)

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FROZEN FISH PRODUCTION AND IMPORTS INCREASE:

The four Greek fishing vessels that fished off the Northwest African Coast (Mauritania) during 1959 landed 3,900 metric tons of frozen fish. In addition, frozen fish imports of 2,269 tons (valued at US$645,000) from January-June 1959 were up by 449 tons from the 1,820 tons (valued at US$468,000) imported in 1958. For the whole of 1959, it is estimated that frozen fish imports will total 5,000 tons, valued at US$1,500,000.

In 1960 it is estimated that 10 vessels under construction in foreign shipyards will be added to the fleet. With these additions to the fleet of vessels equipped for freezing fish at sea, landings of frozen fish in 1960 are expected to be about 12,000 tons and by 1961 should reach 18,000 tons.

Some Greek fishing firms find the expansion of the landings and imports of frozen fish a cause of worry. These firms have requested the Government to postpone new ship building and curtail imports, the Greek fishing periodical, Aleia reported in the December 1959 issue.

Haiti

NEW TAX ON IMPORTED FISHERY PRODUCTS:

A new Haitian tax of 5 percent on the c.i.f. value of imported luxury foodstuffs, including practically all fishery products except fresh and salt fish, became effective on January 27, 1960. The fishery products subject to the new tax are as follows: Tariff Item No. 12433: salmon, simply prepared and preserved in cans; No. 12434: cod fish, herring, aiglefin (haddock), mackerel, tuna with or without sauce or oil, and salmon packed in sauce or oil; 12434A: kippered herring (smoked herring in boxes without oil added); No. 12435: sardines and similar fish, with or without oil; No. 12436: anchovies and anchovy paste; No. 12437: caviar, fish eggs, and fish paste; No. 12438: oysters and shrimp in cans: No. 12439: other fish, scallops, and seafood products, preserved.

Most luxury-type foods imported into Haiti are also subject to a general luxury tax of 4-6 percent, depending on the product. Information on the fishery products against which this tax is levied is not available. (United States Embassy at Port-Au-Prince, February 9, 1960.)

Honduras

SHRIMP INDUSTRY:

Production: Prior to 1958 shrimp landings in Honduras amounted to about 50,000 pounds. In 1958, Honduras, along with other Central American countries, experienced a mild boom and landings in that year were probably close to 900,000 pounds. However, in 1959 the trend was reversed due to (1) unfavorable legislation which curtailed the operations of foreign vessels (mostly United States) and (2) the drop in United States shrimp prices. Maximum potential is between 1-3 million pounds of headless shrimp a year, half white and half pink.

The size of the shrimp is reported to average about 26-30 count per pound (headless), and very few under 15-count shrimp are caught. Two species dominate the catches--white shrimp (Penaeus schmitti) and pink shrimp (Penaeus duorarum).

Fishing Fleet: As of mid-October 1959, there were only eight active shrimp trawlers fishing for shrimp in Honduras. A freezership, which had been operating with a fleet of five trawlers, grounded and sank, and several trawlers were laid up for repairs. All of the vessels are powered with Diesel engines and range in length from 30 to 70 feet. No shrimp fishing vessels are being built in Honduras. Further additions to the fleet at the present time are doubtful due to restrictive laws, and the high cost of production.

Costs of Production: For independent vessels, costs (based on 1958 figures) of producing shrimp for export are estimated to be about 51.5 U. S. cents. These costs are as follows: ex-vessel price, 32.5 cents; freezing and grading, 7.0 cents; cases and cartons, 3.0 cents; unloading or permit charges, 5.0 cents; and export taxes, 4.0 cents. In addition, cost of ocean freight to the United States is about 3.5 cents a pound, and other costs incurred to the point of distribution in the United States includes unloading, storage, and commission. These costs help to explain the sharp drop in exports in 1959.

Shore Facilities For Processing Shrimp: There are two freezers located in Honduras. One plant is located on the Island of Guanaja and the second on Caratasca Lagoon. Another freezing facility was the freezership which was lost by sinking. Ice costs about $12.50 a ton and Diesel fuel 20 U. S. cents a gallon.

Exports and Taxes: No reliable figures on shrimp exports are available from Honduras. According to United States Customs figures, imports of shrimp from Honduras jumped from none in 1957 to about 836,000 pounds in 1958, and then declined to 271,000 pounds in 1959.

Prior to September 1959 export taxes amounted to 10 percent on a valuation of 1.5 lempiras a pound (about 75 U. S. cents) plus an additional tax of 10 centavos a 100 kilos. Currently export taxes amount to 10 percent on an export price of 80 centavos (40 U. S. cents a pound) plus the 10 centavos a 100 kilos mentioned above. This amounts to slightly over 4 U. S. cents a pound, the United States Embassy at Mexico reported on December 14, 1959.

Iceland

CONVENTION PROPOSES INCLUSION OF COASTAL SHELF IN TERRITORIAL FISHING LIMITS:

A national Fisheries Convention was held in Reykjavik, Iceland, the week of February 7, 1960, with delegates representing the seamen, fishing boat owners, and fish processors. This convention issued a resolution to the effect that Iceland's "entire coastal shelf shall be within the fishing jurisdiction limits" and it is Iceland's "duty and right to decide conservation measures for the fish stocks on the coastal shelf. . . ."

In the opening speech it was mentioned that the catch per fisherman has increased 20 times since 1905. In 1959 the fish catch per working fisherman came to 100 metric tons. (United States Embassy at Reykjavik, February 19, 1960.)

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FISHERIES TRENDS, JANUARY 1960:

On January 14, 1960, the Icelandic Federation of Labor announced that the negotiations committee for the Seamen's Union had recommended to the participating unions that wages and terms for

Iceland (Contd.):

fishermen on the motorboat fleet temporarily remain the same as those for 1959.

At a meeting of the Reykjavik Municipal Fisheries Board on January 4 it was announced that the Municipal Fish Packing Center would join the Freezing Plants Corporation for frozen fish export purposes.

Since the Municipality purchased the fish packing center from the State last summer it has almost doubled the center's capacity. It continued to use the same agents abroad for selling its frozen fish products.

The decision to join the Freezing Plants Corporation increases the latter's share of the frozen fish export market from about 81-85 percent. The remainder is sold by the Federation of Iceland Cooperative Societies.

With the opening of the winter cod season, Icelandic trawler owners are faced with a severe shortage of fishermen. This shortage is primarily due to the Faroese Fishermen's Union refusing to permit their members to work on Icelandic vessels until assurances were obtained that they would not suffer as a result of the rumored currency devaluation and would not have to pay Icelandic taxes. However on January 21 a telegram was received from this Union that three representatives would arrive in Reykjavik on January 26 to talk terms with the Union of Iceland Fishing Vessels Owners. The importance of the Faroese for manning the Icelandic fishing fleet is seen from the fact that last year 880 foreign seamen, mostly Faroese, out of 6,000 crew members manned vessels of the fishing fleet. (United States Embassy at Reykjavik, January 25, 1960.)

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FISHERY LANDINGS IN 1959 BREAK RECORD:

Preliminary estimates on the landings of fishery products in Iceland of 623,000 metric tons make 1959 the best year in history. This amount exceeds the very good landings made in 1958 by 42,000 tons. The record landings made in 1959 were due primarily to the good herring catch, which exceeded the 1958 landings of that species by 76,000 tons.

Although the over-all 1959 herring fishery was excellent, the South Coast season which ended on January 12, 1960, was disappointing in the landings of large herring suitable for salting. In 1958, the South Coast fishery yielded 107,000 barrels of salted herring as compared with 51,488 barrels during the 1959 season. The 1959 production of salt herring was not sufficient to meet the commitments on advance contracts of 58,000 barrels. (United States Embassy at Reykjavik, January 25, 1960.)

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VESSEL OWNERS FAIL TO REACH AGREEMENT WITH FAROESE FISHERMEN:

Negotiations have been broken off between the Federation of Icelandic Fisheries Owners and the Chairman of the Faroese Seamen's Union, regarding terms of employment for about 800 Faroese fishermen who would serve on Icelandic fishing vessels between February and May or June of this year.

Although there were differences over a number of issues, the chief issue maintained by both the Icelandic vessel owners and the Iceland Seamen's Union is that Faroese seamen must not receive better wages than those paid to Icelandic fishermen. The Faroese Union demanded that Faroese fishermen receive 1,500 Danish kronur a month (about US$217) as minimum wages. Last year Faroese fishermen were authorized to send home approximately 1,060 Danish kronur a month (US$154).

On February 5 it was announced that the Faroese Fishermen's Union intended to sue the Union of Icelandic Fishing Vessel Owners for pay still due certain Faroese fishermen. The Icelandic vessel owners' group replied that it was surprised at this move since it would not be held financially responsible for the unfortunate failure of a few vessel owners to properly pay wages.

The impasse in negotiations face Faroese with unemployment and a number

Iceland (Contd.):

of Icelandic trawler owners with shortages of fishermen. On February 2, a leading fish producer in Iceland suggested compulsory service as a solution for the fishing fleet's manpower problem. (United States Embassy at Reykjavik, February 8, 1960.)

Iran

SHRIMP INDUSTRY TRENDS, DECEMBER 1959:

As of late 1959 there was only one shrimp fishing company active in the Iranian shrimp fishery. This firm, which is controlled by a New York City importing firm, is reported to have nine Diesel-powered shrimp trawlers. These vessels are 65 feet long with a displacement of about 50 tons. The 1,000-ton freezership, which was due to arrive in Iran about September 1959, broke down in the Mediterranean and until ready to begin operations in the Persian Gulf, shrimp fishing has been limited to two vessels. A second Iranian fishing company, formerly engaged in fishing for shrimp and other fish, no longer lands shrimp.

No official statistics on the shrimp landings are maintained, but some data on exports are available. According to the customs data, exports of shellfish in 1958 were made to Italy (117 metric tons, valued at US$94,000), to the United States (82 tons, valued at $92,000), and to Oman (17 tons, valued at $4,000). According to United States Customs records, exports to the United States in 1959 increased sharply to 740,000 pounds.

Ireland

CUSTOMS DUTY ON MARINE OILS INCREASED:

Effective December 11, 1959, Ireland's Department of Industry and Commerce increased the customs duties on refined vegetable, fish, and marine animal fats and oils 50 percent (full) and 33½ percent (preferential--United Kingdom and Canada) ad valorem. The previous rate was a flat 33⅓ percent ad valorem. (United States Embassy reported from Dublin, January 13, 1960.)

Italy

FISH FREEZING AND STORAGE FACILITIES:

The refrigeration of Italian fishery products is carried out in ice-refrigerated spaces with a capacity of 25,000 cubic meters. Fast-freezing is carried out on six ships provided with freezing equipment and in six shore-freezing plants. The storage capacity of cold-storage warehouses operated in port areas is large enough to allow the storing of frozen imported fish.

During transportation, refrigerated products are usually kept at temperatures ranging from 2° C. to 3° C. (35.6° to 46.4° F.), while frozen products, either slowly or rapidly frozen, are kept at temperatures ranging from -10° C. to -7° C. (14° to 19.4° F.). Deep-frozen products are usually kept at -20° C. to -18° C. (-4° to -0.4° F.). (United States Embassy in Rome, January 12, 1960.)

Japan

WINTER ALBACORE FISHERY TRENDS, JANUARY 1960:

Since the beginning of the year, there have been signs that the beginning of winter albacore fishing was close at hand. Small quantities of hook-and-line fish, some 1,000 metric tons in all, were landed in January at Ishinomaki, Onagawa, Nakaminato, Yaizu, and Shimizu. In addition, some 500 tons of long-line albacore were landed at Katsuura, in the central part of Honshu, and Shimizu.

The hook-and-line fishing in January was in the vicinity of 144° E. longitude and 36°30' N. latitude, where about 50 vessels were said to be operating. The

Japan (Contd.):

long-line fishing was around 152° E. longitude and 30° N. latitude. Hook-and-line albacore weigh 37-40 pounds each on the average and almost all of them are being bought for canning purposes. Long-line albacore are divided about equally between the canners and freezers. (Suisan Tsushin, January 20, 1960.)

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PORT OF SHIMIZU BOOMING WITH WINTER ALBACORE AND INDIAN OCEAN TUNA:

Since mid-February landings of winter albacore at the port of Shimizu have been good and from 2,000-3,000 large albacore (between 24-33 pounds each) were landed every day and were bought by the canners. These winter albacore were landed by about 35 boats from Kushikino, Kagoshima Prefecture, which reported good fishing and are now based at Shimizu. These fish from nearby waters were sold at the high price which has prevailed since the end of 1959. At the same time, tuna boats were coming in from the Indian Ocean one after another. According to their reports, this year three times as many boats are fishing in that area, but catches appear to be good.

The port of Shimizu also received landings every day of Indian Ocean bluefin. In December 1959 there were landings of 131 tons of Indian Ocean bluefin and albacore by four boats from Mie and Kagoshima Prefectures, and the bluefin sold for 533 to 3,850 yen per 10 kg. (US$148-1,069 a metric ton), the southern albacore at 850-950 yen ($236-264 a ton), and local albacore at 910-1,050 yen ($253-292 a ton).

The Japanese vessel No. 2 Wako Maru (260 tons gross), which is famous for big landings of Indian Ocean tuna, sailed December 26, fished for 9 days, from January 13 to 21, caught 116 to 342 Indian Ocean bluefin each day, and made a quick trip back with 80 metric tons of tuna.

The fishing took place at 23°-26° S., 101°-107° E. in surface water temperatures of 21°-22° C. (69.8°-71.6° F.). Although there are three times as many boats fishing in that area as last year, catches are good, with all boats taking 4 to 10 tons a day. It is anticipated therefore that landings of Indian bluefin will continue at a good level for some time. (Nippon Suisan Shimbun, February 17, 1960.)

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ATLANTIC ALBACORE SEASON ENDS WITH ONLY 5,000 TONS:

Fishing conditions early this year in the Atlantic tuna fisheries as operated by about 35 Japanese long-line vessels are described in the Japanese periodical Suisan Tsushin. The reported decline in the hooked rate had occurred, it seems, particularly in the fishing of Atlantic albacore.

Albacore fishing off Brazil had shown a sharply increased catch for some time since the end of November 1959 and a forecast was made in December that 15,000 tons would be caught by the end of the season early this year. But by January 27, 1960, only 5,000 tons or so had been caught and the end of the albacore season came earlier than expected.

In place of albacore, yellowfin fishing off the Gold Coast of Africa has developed. A good fishing pace was reported--12 to 20 tons a day per vessel--with a rate-of-catch equal to that of two years ago. The yellowfin being caught in the area are smaller than the type suitable for export to the United States, but most of the fishing vessels have sales contracts with such European countries as Italy and Yugoslavia.

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REGULATIONS FOR TRANSSHIPMENT OF FROZEN YELLOWFIN TUNA EXPORTS TO UNITED STATES IN 1960:

The shipboard freezers' section of the yellowfin tuna committee of the Japanese Export Tuna Freezers' Association met on February 22 to work out a final plan for regulating transshipment exports of frozen yellowfin tuna (mostly from the Atlantic) to the United States during the 1960 export year. In form the regulations will not be greatly different from last year's, but in substance there will

Japan (Contd.):

be a considerable revision. The main points are as follows:

1. It is likely that the restriction of 2 trips per year per vessel will be removed. If this materializes, it is possible that medium-sized tuna vessels will begin regular operations out of the base at Freetown in Sierra Leone, West Africa. This will mean a change of the Atlantic tuna fishery from a simple distant-water operation to a foreign-based type of fishery.

2. Hitherto the regulation of transshipments of tuna to the United States was aimed only at Atlantic operations, but beginning with the new export year, Indian Ocean and Pacific Ocean operations will also come under regulation. This means, in actuality, the recognition of transshipment exports from the Indian Ocean, and brings up the possibility of a broad change in the pattern of operations in the Indian Ocean. However, transshipments from the Pacific will probably be prevented by the new system of designating transshipment ports.

3. It is not yet finally settled, but plans are under examination for revising the method of calculating the annual limit on total number of trips for transshipment (100 to 120 trips), so that trips on which the vessel is not loaded to capacity, or trips by medium-sized vessels, will not be counted simply as one trip but will be prorated; for example, as one-half a trip. (Suisan Tsushin, February 22, 1960.)

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EXPORT QUOTA TO U. S. FOR FROZEN TUNA LOINS AND ALBACORE DISCUSSED:

The Japan Frozen Foods Exporters Association tentatively decided early in February that for 1960 the export quota to the United States directly from Japan for frozen tuna loins will be 4,000 short tons, and frozen albacore tuna 30,000 tons.

The 1959 quotas were 3,000 tons for loins and 30,000 tons for albacore. (Suisan Tsushin, February 4, 1960.)

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CANNED TUNA IN OIL EXPORTS DOUBLE:

Japanese exports of tuna canned in oil from April to December 1959 amounted to 1,136,000 actual cases, or nearly double the 599,000 cases exported during the same period of the preceding year, according to a compilation by the Export Tuna Canners' Association. Of this total, white meat accounted for 156,000 cases (115,000 the year before) and light meat for 980,000 cases (484,000 cases the preceding year).

Exports in actual cases from April-December 1959 went to (1958 figures in parentheses): Germany 344,772 (188,828), Canada 103,864 (86,852), United Kingdom 102,457 (40,791), Saudi Arabia 88,428 (44,907), Belgium 79,325 (49,289), Lebanon 78,608 (22,105), Netherlands 68,998 (47,913), Syria 66,130 (1,179); Total (omitting smaller markets)--1,136,863 cases (599,886).

Total exports for the calendar year 1959 were 1,346,792 cases. Very little tuna canned in oil is exported to the United States. (Suisan Tsushin, February 20, 1960.)

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PRICE CUT FOR CANNED LIGHT MEAT TUNA IN BRINE DISCUSSED:

The Japanese Tuna Canners Association early in February held its directors' meeting and discussed a price cut for canned light meat tuna in brine for export to the United States. The exporters' side of the Association asked for a price cut because of weak market conditions. It was decided to leave the matter to the discretion of the president of the packers association and the president of the sales company.

The general opinion was that a cut of 30¢ a case on light meat, on the basis of the present price of $7.30 f.o.b., may be sufficient, but the president of the sales company stated that he thought a 50¢ reduction was necessary. If the cut of 50¢ a case is accepted, the new price on light meat will be $6.80 a case f.o.b. Also, the sales company reported that it expected to put up 200,000 cases of light meat on the first sale in February. (Fisheries Economic News, February 4, 1960.)

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Japan (Contd.):

METHOD OF DETERMINING FRESHNESS OF TUNA DEVELOPED:

Studies of the deoxidizing enzymes in fish have produced a new method of determining the freshness of tuna. These studies have revealed for the first time the reason for the existence of the dark lateral muscle tissue in such migratory fish as tuna.

The migratory fish are much more active than the sedentary fish, and in them the dark lateral muscle tissue performs the same functions as the liver in compensating for this additional activity. When the fish dies, the action of the enzymes decreases. From the degree of this decrease the amount of time the fish has been dead can be determined and this can be used in measuring the freshness of the fish.

It is reported that measurements by this method can be made in about five minutes, and it is expected that it will be used in the future for determining the freshness of frozen tuna for export.

Assistant Professor Fukuda of the Fisheries Department of Miyazaki University has received a doctor's degree for his studies which led to this method of determining the freshness of tuna. (Suisan Tsushin, February 20, 1960.)

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TUNA RESEARCH CONFERENCE:

The 1960 Tuna Research Conference, sponsored by the Nankai Regional Fisheries Laboratory of the Japanese Fisheries Agency, was held from February 2-4, 1960, at Kochi. About 60 tuna research biologists from universities and laboratories all over the country were in attendance. The purpose of the conference was an exchange of data on the tuna research done by the various research agencies during 1959, in order to establish a basis for future development of the fisheries. (Nippon Suisan Shimbun, February 5, 1960.)

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NO CALIFORNIA OFFICE TO BE SET UP BY JAPANESE FROZEN TUNA JOINT SALES COMPANY:

Late in December 1959, a Japanese periodical reported that the Japanese frozen tuna export industry was planning to set up an office in California of the Japanese Frozen Tuna Joint Sales Company. The United States legal counsel and advisor of the Japan Export Frozen Tuna Products Association and Japan Frozen Food Exporters Association reports that no office will be established in California.

The original report indicated that the Japanese frozen tuna export industry planned to establish an office of the Joint Sales Company in California, in order to improve the conditions for delivery of frozen tuna to the United States and to strengthen the Japanese inspection system. The Japanese producers had been considering the establishment of an office in California for some time, but the idea was dropped during the process of setting up the new joint sales organization.

The trading companies opposed setting up an office in California for the Joint Sales Company, as it would benefit the producers as opposed to the traders, and they argued that it would be better to utilize the existing offices of the trading companies more effectively. (Suisan Keizai, December 24, 1959.)

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FISH MEAL FACTORYSHIPS PREPARE FOR NEW BERING SEA FISHING SEASON:

The three Japanese companies that are operating fish-meal factoryships in the Bering Sea this year hastened preparations to have their vessels sail in mid-April. In particular, the company which has bought the Renshin Maru and which also has the Kinyo Maru (which operated last year) hoped to get both fleets ready to sail from Hakodate by April 10, because of demands from the Bureau of Animal Husbandry and the Federation of Purchasing Cooperatives for 5,000 metric tons of fish meal by mid-May.

Earlier, at the request of the Bureau of Animal Husbandry, the Japanese Fisheries Agency had approved the importation of 20,000 tons of fish meal annually. This was done in order to stimulate the producers of saury meal in northern Honshu and Hokkaido, who were holding their product off the market for speculative reasons. Now one of the compa-

Japan (Contd.):

nies operating fish-meal factoryships has decided to try to supply 5,000 tons of meal by mid-May (or 3,000 tons, depending on circumstances) in order to hold the imports down to as low a level as possible and at the same time to meet the request of the Federation of Purchasing Cooperatives and stimulate the saury meal producers to turn loose their stocks.

Production plans for the Kinyo Maru and Renshin Maru fleets total 26,000 tons of fish meal. Last year the Kinyo Maru sailed April 15 and spent a week in test operations after reaching the fishing grounds, so in actuality she will be about 10 days earlier in beginning operations this year. (Suisan Tsushin, February 22, 1960.)

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TRAINING SHIP TO SURVEY FISH MEAL PROSPECTS OFF CANADIAN WEST COAST:

The Japanese training ship Kano Maru (152 tons gross) of the Usetsu Prefectural Fisheries High School, Ishikawa Prefecture, has been tentatively chartered to a Japanese fishing company to act as a fish-meal survey ship off the west coast of Canada beginning in April 1960. Up to now this vessel has worked as a survey ship in the salmon fishery for the Japanese Fisheries Agency, but with a yearly charter fee of 5 million yen (US$13,900), there has been a loss of around 640,000 yen ($1,800), in addition to docking charges and other costs.

Under the provisional charter with the Japanese fishing company, its income will be about 9 million yen ($25,000). The charter will be finalized after approval by the Prefectural Legislature. The committee which operates the vessel is hoping that not only will financial losses be ended, but that training of students in new fishing and processing methods will become possible under the new arrangement. (Suisan Keizai, February 25, 1960.)

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USE OF FISH-MEAL FACTORYSHIPS OFF SOUTH AMERICA AND AFRICA STUDIED:

A large Japanese company is planning to send one of its directors to Peru, Equador, and Angola to study possibilities of operating its fish-meal factoryships (Kinyo Maru and Renshin Maru) off those countries when they are not engaged in fish-meal operations in Japanese waters.

The company intends to participate in joint enterprises with those countries by sending the Renshin Maru to Peru and Equador. Those countries are asking for technical assistance in meal manufacturing. The Kinyo Maru would be sent to Angola. The factoryships would collect catches from fishing boats operating off those countries and process fish meal and oil, which would be sold to local operators. (Suisan Tsushin, January 20, 1960.)

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SALMON STUDY TEAM TO VISIT THE UNITED STATES:

According to an officer of the Japan Salmon Resources Conservation Association, plans are being made for a party of six Japanese fishery experts to visit the United States from July 27-September 25 under the auspices of the Japan Productivity Center.

The objective of the trip will be to study techniques and policies for the conservation and propagation of salmon, with emphasis on hatching and rearing, protection of the fish during their life in streams, and improvement of physical environmental conditions in fresh waters where salmon occur.

The party will be headed by the Vice-President of Japan's largest salmon fishing company and will include the former Director of the Japanese Fisheries Agency, the Vice-President of the Inland Waters Fisheries Federation, a representative of the Promotion Section of the Fisheries Agency, and one member each from the fisheries departments of Gifu and Iwate Prefectures. The itinerary and schedule are being worked out in co-

Japan (Contd.):

operation with the U. S. Fish and Wildlife Service and the U. S. Operations Mission to Japan. (United States Embassy in Tokyo, February 12, 1960.)

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SOME PROGRESS IN REDUCING SALMON FISHERY FLEET:

Because of the severe cut in Japan's high-seas salmon-catch quota that resulted from last year's Soviet-Japanese fisheries conference, and the strong possibility that the quota will be reduced even further at the current conference at Moscow, the Japanese Government has been trying since late last year to bring about a reduction in the size of the salmon fleet. Favorable fishing conditions and an increase in the price of canned salmon in 1959 made it possible for 16 motherships and 460 fishing boats to operate profitably under the reduced catch quota, but the industry has recognized that to keep this great fleet fishing would risk serious losses if fishing conditions or world market conditions should take an unfavorable turn.

The Japanese Fisheries Agency has run into strong conflicts of interest and political pressures in its task, and progress has been very slow. The large companies which operate the motherships, while recognizing the necessity of a cutback, have been unable to compromise on the proportion by which each company's fleet is to be cut. The fishing boat owners have demanded as their price for quitting the fishery the granting of tuna-fishing licenses and ample financial assistance for making the changeover from salmon to tuna fishing. This proposition has been fiercely resisted by tuna-boat owners, who want no additional competition in their business. Earlier offers by the Fisheries Agency to help the displaced salmon fishermen enter the developing Bering Sea fishmeal factoryship fleets have evidently been spurned, as the loss of an opportunity to take part in the lucrative salmon fishery could hardly be compensated by permission to engage in an untried enterprise which seems unlikely to be able to hold even its domestic market against the competition of Peruvian fish meal.

On February 18 the Japan Salmon Fishing Federation, representing the fishing boat owners' groups, finally decided to accept the Government's plan for a withdrawal of 50 boats from the fishery. The owners of these boats are to be given licenses that will enable them to fish for tuna nine months out of the year. No decision has been made as to compensation that each owner may receive, although their Federation is talking in terms of ¥4 million (US$11,000) from the Government to assist in outfitting for tuna fishing and ¥2.5 million (US$6,900) monetary compensation from the salmon industry. On February 20 the mothership-operating companies decided that, of the 50 boats to be retired, 19 would come from one fishing company's fleets, 16 from another fishing company and its subsidiaries, and 8 from a third company. A decision as to how many motherships each of the large companies is to retire will be postponed until later. (United States Embassy, Tokyo, February 26, 1960.)

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SQUID LANDINGS IN 1959 NEAR RECORD:

According to the Products Section of the Hokkaido Fisheries Department, Hokkaido's squid landings for 1959 reached 265,000 metric tons, the highest since 1954. Up to the end of the war the Hokkaido squid catch never exceeded 70,000-80,000 tons, but then the "squid boom" began, with catches of 135,000 tons in 1947, 208,000 tons in 1948, 232,000 tons in 1949, 290,000 tons in 1950, 310,000 tons in 1951, 264,000 tons in 1952, 234,000 tons in 1953, and 266,000 tons in 1954. From 1955 on for several years the catches dropped to about 140,000-180,000 tons, but they appear to be increasing again.

The amount of squid shipped fresh out of Hokkaido in 1959 was 19,433 tons, an increase of 4,500 tons over the preceding year.

Fresh squid consumption within Hokkaido was 12,500 tons, up 4,400 tons over 1958. Per capita consumption in Hokkaido was 2.5 kilograms (5.5 pounds); 146,861 tons were used for drying; 60,774 tons were frozen; and 24,758 tons were used for salting, smoking, canning,

Japan (Contd.):

etc., making a total of 232,394 metric tons of squid that were processed in Hokkaido. (Nippon Suisan Shimbun, February 5, 1960.)

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EXTENSION OF TERRITORIAL WATERS WOULD ADVERSELY AFFECT FISHING:

In March at Geneva a conference on the Law of the Sea will be held to decide the area of the territorial seas and to establish other rules governing relations between coastal and maritime states. The Japanese Fisheries Agency is gathering data on the effects of a 6 plus 6 plan (6 miles for territorial waters and an additional 6 miles for fishery jurisdiction) as well as the criteria that would be used if rights established within the past 5 years in the zone of exclusive fisheries jurisdiction were recognized, according to a news release in the Japanese periodical Suisan Keizai, February 21, 1960.

In view of the various responsible sections of the Fisheries Agency, if the conference should settle on the total 12 miles of territorial waters and fisheries zone of the United States proposal: (1) the Japanese catch of whales in the Aleutian area would be decreased by 80-90 percent for sperm whales and by 20-30 percent for baleen whales (compared with past production); (2) the catch of sedentary or shoal skipjack around islands of the tropical Pacific would be reduced by about 30 percent; (3) even though the Rhee Line were to be erased, if in turn a zone of exclusive fishing rights were established around Saishu Island 12 miles offshore, it would have a serious effect on the mackerel fishery; (4) it would also be disadvantageous for the fishery off the Chinese coast in the South China Sea; (5) the fishing grounds of the trawl fishery in distant waters would be narrowed. Of these various problem points, that of the North Pacific whale fishery is considered the most serious, and the important thing is to ensure recognition for historical rights, according to the periodical.

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U. S. PUBLIC HEALTH INSPECTOR INVITED TO INSPECT OYSTER GROUNDS:

It was expected that an inspector from the U. S. Public Health Service (perhaps accompanied by a bacteriologist) would spend about one month, beginning late in March, inspecting oyster grounds of Hiroshima Bay and the processing procedures for packing frozen oysters. There were no plans to have the inspector survey any areas outside of Hiroshima.

The United States inspector was invited in connection with the revision of Hiroshima's prefectural ordinance on oyster sanitation. After the revision, oysters from other than designated areas within Hiroshima Prefecture cannot be exported. The inspector's visit to Japan and the revision of the prefectural ordinance were promoted by a Japanese fishing company which is building a new oyster packing plant at Hiroshima. The plant is expected to pack frozen oysters.

The Japanese company explained that the inspector's objectives were limited to areas within Hiroshima Prefecture. (Suisan Tsushin, February 25, 1960.)

Republic of Korea

EXPORTS OF FISHERY PRODUCTS HIGHEST IN SIX YEARS:

The Korean Office of Marine Affairs has announced that Korean fisheries exports in 1959 totaled 7,602 metric tons, valued at US$4.2 million. The figures represent 53 percent of the export target as to quantity and 65 percent as to value of the original export goal for the year.

In spite of the trade suspension with Japan on June 15, 1959, fisheries exports increased by more than $490,000 over the previous year and the 1959 total was the highest in value since 1953.

Fisheries products were exported to 12 countries, with Japan the leading purchaser (76 percent of total), followed by Southeast Asian nations, and the United States. Major export items were dried

Republic of Korea (Contd.):

cuttlefish, laver, and fresh and live fish in order of value.

Fishery products represent the best potential source for expending Korean export earnings. The 1959 development is encouraging, but the trade suspension between Korea and Japan is still an impediment to further expansion of fisheries output, the United States Embassy in Seoul reported on February 12, 1960.

Malaya

JAPANESE VESSEL LANDS FIRST TRIP OF TUNA:

The Koshin Maru No. 5, the first Japanese tuna fishing vessel to be sent to sea by a joint Malayan-Japanese fish canning firm, returned to Penang on February 10, 1960, from its initial trip in the Indian Ocean with a catch of 47 metric tons. The catch was 7 tons over the quota for the trip. Very little of the catch was expected to be sold locally. The greater part is to be canned or frozen for export.

Upon hearing of the success of the first trip, the company's managing director stated that the company did not intend to compete with any offshore fishing operations by Chinese and Malay fishermen in the Malayan Federation. The Minister of Agriculture stated that his ministry would see to it that the livelihood of the offshore fishermen, already near the bottom of the income scale, was not thrown out of balance.

The Minister announced that the Malayan-Japanese company, the Government, and the fishing cooperatives were developing a plan for the training of selected local fishermen in deep-sea operations, the United States Embassy in Kuala Lumper reported on February 15, 1960.

Mexico

JAPANESE FISHING VESSELS ARRIVE AT ACAPULCO:

On January 17, 1960, two former Japanese fishing vessels with Japanese crews arrived at the Mexican west coast port of Acapulco. It is reported that the two vessels (now named the Yolanda and the Cecilia) are to be used in the training of Mexican fishermen and to aid the Government and the fishing industry in its program to provide plentiful and inexpensive fish for Mexico. The vessels were received by the Director of Fisheries and representatives of one of the large fishing firms.

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SHRIMP INDUSTRY TRENDS, FEBRUARY 1960:

The Guaymas shrimp fleet on Mexico's west coast of about 150 boats as of mid-February had been tied up since mid-January. Only cooperative-owned boats (reported to be about 20) were fishing. The boat owners claim they could not profitably fish for the sizes of shrimp found off Guaymas at the prices they must pay the cooperatives. As of mid-February an agreement had not yet been reached on the proposal to limit bonus payments to large shrimp. The Guaymas fleet had been catching mostly small-sized brown shrimp.

The west coast Mazatlan and Salina Cruz shrimp vessels, which have been catching larger shrimp, continued to fish and catches were reported good. Some Salina Cruz boats landed as much as 8 or 9 tons of headless shrimp during a 12-day trip.

The east coast Carmen-Campeche area landing-per-boat during January improved somewhat over December. Carmen landings averaged about one metric ton of headless shrimp per trip and those for Campeche about 1.2 tons. About 60 percent of the Carmen landings were 30 count and under per pound whereas about 80 percent of the Campeche landings were under 30 count. Carmen landings ran about 50 percent pink, 35 percent white, and 15 percent brown shrimp. Campeche landings were about 90 percent pink and 10 percent white

Mexico (Contd.):

shrimp, with but a smattering of brown shrimp.

During the last week in January ex-vessel prices in U. S. cents a pound for headless brown shrimp at Salina Cruz and Carmen were: under 15 count, Salina Cruz 47 and Carmen 58; 15-20 count, Salina Cruz 45 and Carmen 53; 21-25 count, Salina Cruz 33 and Carmen 43; and 26-30 count, Salina Cruz 27 and Carmen 38. Ex-vessel prices for smaller than 30 count shrimp at Salina Cruz were 25 cents for 31-40 count, 20 cents for 41-50 count, and 15 cents for over 51 count; and at Carmen, 34 cents for 31-35 count, 29 cents for 36-40 count, 24 cents for 41-50 count, and 17 cents for 51-65 count. White shrimp prices at Salina Cruz were about 2 cents a pound higher, but most of the landings there were made up of brown shrimp.

The Mexican Chamber of Fisheries, the cooperatives, and Government officials are each undertaking cost surveys in preparation for contract negotiations which are scheduled for signature in May, the United States Embassy at Mexico City reported on February 12, 1960.

Morocco

CANNED SARDINE PRODUCTION QUOTA ESTABLISHED:

At a meeting on February 13, 1960, of a committee including Moroccan Government and fish canning industry representatives, the quota for the production of canned sardines was established at 1,900,000 cases of 100 cans each for the 1960/61 season beginning in June 1960. Since 200,000 cases remain to be packed out of the present season's quota of 1,300,000 cases, the real limit is 2,100,000 cases. This quota is not considered restrictive since this number of cases can be packed only if the catch is very good. The canners were assured by the Government representatives that the regular 600,000 cases of Moroccan sardines would be admitted into France free of duty.

Netherlands

PROFITS FROM ANTARCTIC WHALING FOR 1958/59 SEASON HIGHER:

The management of the Netherlands Antarctic Whaling Company reports that the results for the 1958/59 fiscal year (July 1-June 30) appear to be favorable enough to warrant a cut in the Government subsidy which will be only 1.9 million (US$503,300) as compared to 3.7 million guilders ($980,100) for the preceding fiscal year. Total income amounted to 18 million guilders ($4,768,200) as compared to 17.2 million guilders ($4,556,300) for fiscal year 1957/58. Operation costs dropped from 12.7 million guilders to 11.8 million guilders ($3,364,200 to 3,125,800). Since guarantee payments were first made in the 1951/52 fiscal year, the Government has paid the company a total of 34.4 million guilders ($9,112,600). The management proposes to pay an unchanged six percent dividend.

Table 1 - Netherland's Production of Whale Products by the Factoryship William Barendsz, Seasons 1957/58 and 1958/59

Product	1958/59	1957/58
	(Metric Tons)	
Whale oil	18,663	17,295
Sperm oil	2,295	2,126
Whale meal	3,698	2,302
Vitamin oil	12	15
Whale bones	38	43
Sperm whale teeth	0.711	0.625

The whale oil was sold at an average price of 769.23 guilders ($210.92) per ton. Sperm oil brought an average price of 591.65 guilders ($156.73) per ton and whale meal 597.43 guilders ($158.26) per ton. The other products were also sold. The total value of the entire production by the factoryship Willem Barendsz was 17,987,025 guilders ($4,764,800) as compared to 17,050,957 guilders ($4,516,800) during the preceding year.

The Company reports that the new refrigerating plant of the Willem Barendsz is able to process about 1,500 metric tons of whale meat per season. The production of whale meat in the 1959/1960 and the 1960/1961 seasons has already been sold in advance. The management is planning to expand the

Netherlands (Contd.):

frozen whale meat output which is reported to yield satisfactory prices, the United States Embassy at Amsterdam reported on February 15, 1960.

New Zealand

CANNERY EXPECTS TO BUY TUNA FROM JAPANESE VESSELS:

A Japanese group early this year received from a New Zealand canning company an inquiry requesting the group to send a number of Japanese tuna long-line vessels to operate in the mid-southern area of the Pacific Ocean so that they could provide the New Zealand company with tuna. The company is reportedly building a sizable canning plant at Rarotonga, Cook Island (part of New Zealand). The cannery is expected to start packing vegetables, fruits, and fish, particularly tuna, in April. The company indicated that the canned tuna would be consumed in New Zealand.

Nicaragua

SHRIMP INDUSTRY:

Production of shrimp (headless, dried, and peeled and deveined) in Nicaragua increased from about 110,000 pounds (product weight) in 1956 to about 716,000 pounds in 1958. The production in 1959 (based on figures for first eight months of 1959) should be close to 1 million pounds, according to estimates made by the Nicaraguan Ministry of Economy.

Table 1 - Nicaragua's Shrimp Landings, 1956-58 and Jan.-Aug. 1958-59

	Jan.-Aug.				
	1959	1958	1958	1957	1956
Quantity (1,000 lbs.) . .	507	353	716	115	110
Ex-vessel value (US$1,000) . .	215	165	340	47	40
Ex-vessel value (U.S. cents/lb.)	42.4	46.7	47.5	40.1	36.4

There are no statistics on the catch by species, but observers estimate that close to 95 percent of the catch is white shrimp (Penaeus schmitti). Most of the balance is believed to be brown shrimp (Penaeus aztecus) with very small quantities of pink shrimp (Penaeus duorarum). Most of the production for 1958 and 1959 was headless shrimp for export. The principal fishing season is from August through March.

The active shrimp fishing fleet as of December 7, 1959, consisted of 5 shrimp trawlers and a trawler-freezership (104 feet in length). Two additional vessels were available, but were hauled out for repairs. There is also a 104-foot refrigerator vessel that is used for transporting ice and frozen shrimp. All these vessels are Diesel-powered and range from 52 to 69 feet in length. In addition, there are a number of dugout canoes that fish for shrimp with cast nets in Pearl Lagoon. Most of the fishing is around Cape Gracias a Dios, and occasionally pink shrimp is caught near Punta Mico.

As of December 1959 there were two firms operating shrimp trawlers and producing shrimp for export. One of these firms has a processing plant under construction at El Bluff, and plans call for a freezing capacity of 35,000 pounds in six hours. This firm has seven shrimp vessels available and is reported to be contracting for additional vessels from Costa Rica and Panama. Plans call for a fleet of 60 vessels in the future. The second firm operates the trawler-freezership as an independent operation. Nicaragua's potential shrimp production by trawlers only is about 750,000 to 1,500,000 pounds of headless shrimp a year.

Costs of producing shrimp for export are unknown. The firm with the plans for expansion is offering independent vessels 23 U.S. cents a pound under the New York wholesale selling price. Actual fishing costs for independent vessels are not known since none had started to operate as of December 1959. Crew shares would be less than in Panama, but ice and Diesel fuel would be higher. Over-all costs of producing shrimp for export would be increased by exchange control, which amounts to 2-8 U.S. cents a pound and ocean freight to Cristobal, where shrimp are stored for export to the United States, is about 2 U.S. cents a pound.

It is estimated that about 75 percent of the shrimp landed are 21-30 count a pound, about 5 percent under 20 count, and the remaining 20 percent over 30 count.

Actual exports of shrimp are unknown as the shrimp exports are combined in the official records with other shellfish and turtles. Exports to the United States are mostly frozen shrimp and live turtles, plus small quantities of spiny lobster tails. Exports are shipped on consignment to New York brokers.

Table 2 - Nicaragua's Exports of Shellfish, 1957-58 and Jan.-Aug. 1958

Country of Destination	Jan.-Aug. 1959		1958		1957	
	Qty.	Value	Qty.	Value	Qty.	Value
	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000
United States	340.0	150.4	604.0	315.7	-	-
Panama	15.0	5.3	6.0	3.6	1.5	0.7
Other	0.2	0.2	-	-	1.3	0.6
Total . . .	355.2	155.9	610.0	319.3	2.8	1.3

Note: According to U. S. customs records, Nicaragua exported 277,588 pounds of shrimp in 1958 and 213,000 pounds of shrimp in 1959. Balance of exports to U. S. from Nicaragua is mostly live turtles.

There are no export taxes on shrimp, but export permits are required and there is currency control. For currency purposes shrimp is valued at 35 U.S. cents a pound. The official rate of exchange is 7 cordobas to US$1. The free rate for dollars fluctuates between 7.15-7.60 cordobas. In order to obtain an export permit, dollars in the amount of 35 cents a pound of shrimp must be obtained on the free market and deposited with the National Bank which returns the money at the official rate of 7 cordobas to US$1. This is equivalent to an export tax of 2 to 8 cents a pound.

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SHRIMP INDUSTRY TRENDS, THIRD QUARTER 1959:

Exports of frozen shrimp from Nicaragua during the third quarter of 1959 amounted to about 98,000 pounds, valued at US$32,236, or lower by about 7,000 pounds in quantity and $14,080 in value

Nicaragua (Contd.):

as compared with the second quarter of 1959. Nearly all the third quarter exports were to the United States.

Domestic consumption of shrimp is reported to be increasing gradually and the French-owned Caribbean Coast processing plant at Bluefields is vigorously seeking outlets both in the domestic market and in foreign markets. The plant, only partially completed, is operating at a capacity of 5 metric tons a day. When completed by mid-1960 it will have a capacity of 30 tons a day.

A Panama-based company has been granted a 10-year concession to fish for shrimp off Nicaragua's Caribbean coast. As of mid-February 1960 no effort has been made towards exploiting this concession. (The United States Embassy at Managua reported on February 16, 1960.)

Norway

FISHERY LANDINGS INCREASED IN 1959:

Landings of fish and shellfish by Norwegian fishermen in 1959 amounted to 1,369,665 metric tons, or about 130,800 tons greater than the landings in 1958. The ex-vessel value of the landings was Kr.664.7 million (US$93.1 million), higher by about Kr.82.4 million (US$11.5 million) than the ex-vessel value for 1958. The landings in 1958 were the lowest since 1949.

The cod and herring fisheries are still the mainstays of the Norwegian fisheries, especially the herring fishery which, however, has shown great variations in landings through the last four years. But landings of species other than herring and cod increased during the 1956-1959 period both in quantity and ex-vessel value. Therefore, alternatives to the risky winter herring fisheries have appeared.

The value of deep-water shrimp catches increased in 1959 by more than 9 million kroner (US$1.3 million), and the Norway eel pout fishery in the North Sea--for the first time recorded in Norwegian fishery statistics--yielded about 20,000 tons, at the same time as a further increase of the sand eel fishery took place. Thus fish meal and oil factories in the southernmost districts had supplies of raw material other than herring. The herring fisheries have seen a promising development of a trawl fishery.

Squid fishing in Northern Norway, which suddenly gained importance in the 1958 statistics with landings of nearly 10,000 tons, dropped in 1959. The saithe or coalfish landings reached 90,000 tons.

Future development of the Norwegian fisheries was discussed eagerly in 1959. In spite of opposition it is to be expected that the Norwegian deep-sea fishing fleet will tend to increase in number and size of vessels, and engage further in fishing in distant waters. (The Fishing News, vol. 6, April 1959.)

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EXPERIMENTS WITH FLOATING TRAWLS IN WINTER HERRING FISHERY:

During the 1960 winter herring fishery, the Norwegian research vessel Thor Iverson was scheduled to try out "floating trawls" for the first time in that fishery. The experiments are being made off the west coast of Norway. (News of Norway, January 7, 1960.)

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WINTER HERRING FISHERY STARTS LATE:

The Norwegian winter herring fishery commenced on February 2, 1960, the latest recorded starting date for this vital fishery which accounts for a major part of the total annual Norwegian fish landings. As of the above date in 1959, over one million hectoliters (102,500 short tons) of herring had been landed, but bad weather during much of the remainder of the 1959 season caused the fishery to fail for the second year in succession.

Catches during the first few days of this season have been disappointingly small and while there still remains some hope for a fair season, the herring fish-

Norway (Contd.):

ermen fear that unless large catches are taken soon, the fishery may fail again in 1960.

Taking into account the reduction in the herring stocks and the tendency of the shoals to approach the coast farther north where the fishing conditions are more adverse, the Government's estimate for the 1960 winter herring catch, which was made well before the start of the season, is only five million hectoliters (512,500 short tons) or 500,000 hectoliters (51,250 short tons) greater than the catch last year. In 1956, a record 12.3 million hectoliters (1,260,750 short tons) of herring were taken.

The winter herring fishery off the Sunnmøre coast of West Norway traditionally ends February 15. According to all calculations, the herring should have reached coastal waters by then. But, though the whole fishing fleet tried its luck on the banks, catches remained distressingly small. Nor was there much herring 25 nautical miles at sea, reported some of the biggest purse-seiners.

Fishery specialists aboard the Norwegian ocean research vessel G. O. Sars, which first located huge herring shoals at a distance of some 145 nautical miles off West Norway, expected the main influx to reach coastal spawning grounds. Even so, prospects for a good catch of the fat winter herring would seem rather dim. As of February 3 total landings amounted to less than 18,000 metric tons, with a first-hand value of about Kr.500,000 (US$70,000). At the same time last year, Norwegian fishermen had brought ashore nearly 120,000 tons which represented a value of about Kr.25,000,000 ($3.5 million).

The fleet of some 2,500 small and large fishing craft, with crews totaling almost 20,000, waited impatiently in and around the port of Aalesund for about three weeks. Most of the vessels were kept in constant readiness to take off for the fishing grounds on a minute's notice from research vessels. About 150 more nylon purse-seines are in use this year, bringing the total to nearly 250. Each nylon net costs from Kr.95,000 to Kr. 120,000 ($13,000-16,800), of which 20 percent is subsidized by the State. While nylon nets are much stronger than those made of cotton they also cost a great deal more.

The herring have been approaching the Sunnmøre coast at a somewhat slower pace than in former years, due to a cold water front stretching far out into the Norwegian Sea. And they have been moving at a depth far beyond the reach of purse-seiners, though that may change in the warmer water found on the spawning grounds.

According to oceanographer Finn Devold, Norwegian fisherman would be well advised to spread their activities over a longer part of the coast. For, judging from all indications, the exceptionally large concentration of winter herring off the Sunnmøre coast is likely to be a thing of the past. For some years to come, he predicted, the herring will probably show up all along the west coast, from Møre to the Røst bank in North Norway.

Greater participation in the North Sea fat herring fishery has been urged as a means of diversifying activities. Right now, large catches are being made only a couple hours' time from the southwestern port of Egersund. For various reasons, only a few Norwegian vessels are taking part.

One of the advocates of larger participation in the North Sea is the Norwegian Fisheries Minister. In a recent interview he said more purse-seiners should give the North Sea a try, rather than staking all on the coastal winter herring fishery. If the latter were to fail for the third year in a row, seiners would be hard put to pay for their costly equipment, he stressed.

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1960 FAT HERRING FISHING SEASON ENDS:

Although some herring appeared off the west coast of Norway on February 2, 1960, the main winter herring shoals did not arrive until ten days later. Due to the extremely late arrival, the "large" or "fat" herring season was extended by

Norway (Contd.):

one week to February 21 and came to an end at midnight or February 23. This is of much significance to the fishermen as the Government-controlled ex-vessel price for the herring is three kroner (about 42 U. S. cents) higher per hectoliter (about 205 pounds) during the "winter" or "fat" herring season than during the "spring" herring season which follows. The lower price is paid when it has been determined that the fat content of the herring has gone below a certain point.

On the herring fishing grounds off the west coast of Norway. Photo shows about 180 tons of herring concentrated in the bag section of a large purse seine which has been tied up to the fishing vessel. Fish are now ready for brailing on board the vessel.

As of February 17, only 1.1 million hectoliters (225.5 million pounds) or about 102,286 metric tons of large herring had been landed. Total landings up to the end of the winter "large" herring fishery were only 2 million hectoliters, or about 185,975 tons, the lowest since 1934. In 1959, the "large" herring fishery yielded about 413,850 tons, and was up to about 70,000 tons in 1957. The "fat" herring fishery season in 1958 was a near failure, with only about 241,000 tons landed. Thus the 1960 "large" herring fishery for the third successive year has been a failure.

It was felt unlikely that combined landings of "large" and "spring" herring would exceed 3.5 million hectoliters, or 325,000 tons.

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FISH FREEZING AND FILLETING ORGANIZATION INCREASED SALES TO UNITED STATES IN FISCAL YEAR 1958/59:

The Norwegian joint sales organization for some 30 fish freezing and filleting firms in Norway accounts for about 85 percent of the total Norwegian production of frozen fish fillets..

The total production of frozen fish by firms selling through the Organization amounted to 19,750 metric tons for fiscal year 1958/59 (July 1-June 30), or about the same as in the preceding fiscal year. Exports in fiscal year 1958/59 totaled 17,400 metric tons, valued at 56.8 million kroner (about US$8 million), as compared with 17,750 metric tons, valued at 51.9 million kroner (US$7.3 million), in fiscal year 1957/58.

The volume of exports to the United States, the Organization's principal market, increased substantially from 2,090 tons in 1957/58 to 7,408 tons in 1958/59. This was the most significant development with respect to the Organization's export sales and, according to the annual report of the Organization, the United States market has definitely become more favorable for Norwegian exports than it has been for many years.

The report states that the sales of the Organization have been limited by the uneven supplies of fish and the consequent frequent poor utilization of the plant's total capacity. Another factor which affects the sales of the frozen fish fillets is the price of the raw fish. In this connection, the report speaks strongly against the policy of the fishermen's marketing association of setting higher ex-vessel prices for fish sold to the freezing and filleting industry than to the other fish-processing industries.

The Organization does not expect any substantial increase in sales to come

Norway (Contd.):

from Norway's affiliation with the European Free Trade Association and warns that the competition will continue to be very strong. It feels instead that, apart from the United States, the United Kingdom, and Sweden, the best prospects for increasing sales of frozen fillets are in the Common Market countries, and for this reason declares that it is very important for the industry that the countries of the "Outer Seven" reach an accommodation with the "Inner Six." (The United States Embassy at Oslo reported on January 13, 1960.)

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STERN-FISHING TYPE TRAWLERS BEING BUILT:

An Aalesund, Norway, fishing company has contracted for two 77-foot stern trawlers, according to a report in Fiskaren (January 20, 1960), a Norwegian fishery trade paper. They are the first of their type to be built in Norway and much is expected of them. Construction of the first one already is under way and it is expected to be delivered in April or May. The second will be completed by the end of the year. They will be equipped with 360-hp. high-speed Diesel engines and have accommodations for ten men. The vessels will have the most modern equipment, but no freezers, because they are designed primarily for coastal trawl fishing.

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TRADE AGREEMENT WITH CZECHOSLOVAKIA INCLUDES FISHERY PRODUCTS:

Norway and Czechoslovakia have concluded a new protocol to the basic trade agreement of March 20, 1947. The new protocol lists fishery in other commodities (together with quotas) which Norway will exchange with Czechoslovakia during 1960. The following fishery products and quotas are listed for export from Norway to Czechoslovakia: (1) fish oils, refined and for technical use, 5,000 metric tons; (2) medicinal cod-liver oil, 800 tons; (3) fresh, frozen, and salt herring, 14,000 tons; (4) fish fillets, 2,500 tons; (5) miscellaneous fish products, including mackerel and tuna, 1,000 tons; (6) canned fish valued at N.kr. 3 million (US$420,000); (7) fish meal, 2,000 tons; and (8) pearl essence valued at N.kr. 500,000 (US$70,000). No fishery products are listed for export from Czechoslovakia to Norway.

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TUNA LANDINGS CONTINUE TO DROP:

Norway's tuna landings in 1959 continued to drop. Total 1959 tuna landings amounted to only 2,500 metric tons, worth 4,725,000 Norwegian kroners (US$661,500), as against landings of 2,850 tons in the previous year and as much as 10,300 tons in the 1955 season. (The Fishing News, January 29, 1960.)

Pakistan

SHRIMP INDUSTRY TRENDS OCTOBER-DECEMBER 1959:

The Pakistan shrimp catch the last quarter of 1959 at times was so large that the freezing plants were glutted and facilities for drying and curing were unable to absorb the excess. As a result, there was a sharp drop in prices of shrimp. Since about six additional trawlers had gone into operation during the quarter, the Government suspended for a while the operation of its trawlers so as not to compound the difficulties by bringing in additional shrimp.

In the first quarter of 1960 it is expected that the freezing plant located within the area of the fish harbor at Karachi will be put into operation and thus will increase the freezing capacity by 15 tons daily. The shrimp drying and curing areas are also being expanded. During the first quarter of 1960, however, at least six more trawlers will be added to the fleet. (United States Embassy, Karachi, January 22, 1960.)

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FISHERIES TRENDS, FEBRUARY 1960:

The first fish freezing, processing, and canning plant in East Pakistan was scheduled to start operations on Febru-

Pakistan (Contd.):

ary 27, 1960. This plant, operated by a fish preservation and marketing corporation and located at Chalna, is heralded as another foreign exchange earner.

New tuna fishing grounds have been discovered in the Bay of Bengal, but their potential has not been fully determined, the United States Embassy in Karachi reported in a February 25, 1960, dispatch.

Peru

EXPORTS OF FISH MEAL AND FISH OIL UP SHARPLY IN 1959:

Peru's fish meal and fish oil industry continued to expand output rapidly in 1959, producing an estimated 285,000 short tons of fish meal and 19,500 tons of fish oils. The 1959 output of fish meal was more than double the 135,000 tons produced in 1958, and fish oil production was up 70 percent. Relatively good demand kept fish meal prices high during 1957 and 1958, and encouraged expansion of the industry.

Peru's Exports of Fish-Meal and Oil by Country of Destination, 1955-58, Estimated 1959

Item and Country	1959	1958 1/	1957	1956	1955
		(Short Tons)			
Fish meal:					
United States	-	30,590	18,126	7,012	9,193
Germany, West	-	29,378	12,649	2,759	2,331
Netherlands	-	36,295	29,900	17,901	6,082
United Kingdom	-	11,917	1,435	-	518
Other	-	8,418	5,841	6,465	2,507
Total	2/270,000	116,598	67,951	34,137	20,631
Fish oil:					
Germany, West	-	593	1,284	991	-
Italy	-	602	222	-	-
Netherlands	-	616	2,476	840	99
Norway	-	-	646	-	-
Other	-	-	154	60	2
Total	3/ 18,000	1,811	4,782	1,891	101

1/Preliminary.
2/Estimated exports Jan.-Sept. totaled 202,922 tons, against 84,564 tons Jan.-Sept. 1958.
3/Estimated exports Jan.-Sept. totaled 15,227 tons, against 1,650 tons Jan.-Sept. 1958.

Most of the fish meal is exported, and exports in 1959 were estimated at 270,000 short tons--more than double the volume of 1958. Exports of fish oil in 1959 may reach 18,000 short tons, compared with only 1,811 tons in 1958. The marked increase in fish oil exports is attributed to a change in the cost of production rate used to compute the export tax. The rate was revised upward from 460 soles (about US$16.60) per ton to 3,000 soles (about US$108) thus sharply reducing the export tax. The 460 soles rate had been in effect for the last 15 years. (Foreign Crops and Markets, U. S. Department of Agriculture, February 1, 1960.)

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FISH MEAL AND OIL INDUSTRY:

Number and Location of Reduction Plants: About 63 plants produce fish meal in Peru at the present time. They are located at a number of ports along the Peruvian coast, including the following: Callao (19), Chimbote (17), Paita (4), Huacho (6), Huarmey (7), and one or two each in Ilo, Casma, Supe, Chancay, Samanco, and Pisco. Plants vary in size from modern establishments capable of producing 40 metric tons of fish meal per hour during a 20-hour working day to small plants using primitive methods, which produce a few tons per day. It is estimated that about 40 of the 63 reduction plants produce fish oil as a byproduct of the fish meal process.

Production and Proportion of Product to Raw Material: The latest data available on production of fish utilized by the reduction plants are for 1958. These data show that 737,019 metric tons of anchovies were landed in that year, and that 126,909 metric tons of fish meal and 10,271 tons of fish oil were produced. Proportions vary according to the size of fish, but as a general rule, one metric ton of fish meal requires 5-1/2 to 6 tons of anchovies. The average oil yield is 1-1/2 to 2-1/2 percent, but may reach 5 percent. No fish solubles are produced.

Domestic consumption of fish meal, which has increased considerably in the past two years, is now about 10,000 tons per year. Thus, 1959 fish meal production may run over 280,000 tons. In November 1959 a trade representative looked for the continuation of the 1959 level in 1960, although a subsequent estimate, made in January 1960, placed this year's production at 300,000 metric tons. Fish oil production for 1959 is expected to show a 70-percent increase.

Value of Each Plant: A moderate-sized plant producing 500 to 800 metric tons of fish meal per day costs an estimated 5 million soles (US$183,000), of which 3 million soles (US$110,000) are for plant, machinery, and equipment, and 2 million soles (US$73,000) for fishing vessels.

Cost of Production: The figures generally quoted by producers of fish meal on production costs have been US$87 to $90 per metric ton, and it has even been suggested that efficient producers might be able to show a profit at production costs of $82 to $84 per metric ton. However, in mid-January a trade representative stated categorically that the cost of production now is just about $90, which leaves no margin of profit for producers at the prices being quoted for fish meal, $80 to $90 per metric ton, f.o.b. Peruvian ports. Those prices include export taxes and other export charges.

The present production cost figure on which the export tax is based, which was established in April 1956, is the equivalent of $64.33 per metric ton. The export tax is 10 percent of the difference between the officially-fixed production cost and the price in the United States (Pacific Coast), less freight and insurance. There is an additional 10 percent ad valorem tax (payable on the excess) on all export products, applicable when the export price exceeds by 25 percent the officially-fixed production cost.

The Peruvian fish meal industry is asking the Peruvian Government to appoint a special committee to study the industry to find ways of aiding it in view of declining world prices. Relief in the situation might take the form of a higher official production cost figure, which would reduce export taxes.

Protein Content: The bulk of Peruvian fish meal, which is intended for export, has a protein content of 65 to

Peru (Contd.):

70 percent; export requirements of the trade call for 65 percent minimum protein content. Inferior grades are produced from fish residue and machete, which vary from 60 to 65 percent in protein content.

Fishing Fleets, Ex-vessel Prices, and Crew Shares: As of December 31, 1958, some 3,200 domestic vessels, probably about 75 percent of them unpowered, were reported to be engaged in fishing in Peruvian waters. In addition, 122 foreign fishing vessels, said to be American, were engaged in fishing operations. Of these, some 97 were licensed to take fish abroad, and 25 were working under the Peruvian flag for local fishing companies. About 45 percent of the tonnage of fishing vessels is thought to be engaged in anchovy fishing. The actual number is not known. Vessels in greatest demand for anchovy fishing, according to shipbuilders, are of 50-ton capacity, although larger ones up to 150 tons are in service and more are being built.

The number of men in each crew varies with the size of the vessel: 40- to 60-ton boats average 9 to 10 crew members; 70- to 90-ton boats, 13-14 crew members.

In mid-November 1959, plants were paying 230 soles (US$8.41) per metric ton for anchovies at Callao and 250 soles (US$9.14) per ton at Chimbote.

Wages paid fishermen engaged in anchovy fishing are said to be greater by far than those received by workers in any other employment in Peru. They are paid according to tonnage of the catch, the sum of 90 soles (US$3.29) per ton being the current rate. It is divided among master of the vessel and crew, the former's share being 1-1/2 times that of individual members. Since a vessel may make two daily trips carrying upwards of 50 tons each trip, each man can make up to 1,000 soles (US$36.55) per day.

Anchovy Landings and Fishing Season: The anchovy catch in 1958 is reported to have been 737,019 metric tons. Since fish meal production for 1959 is expected to be more than double that of 1958, an anchovy catch of close to 1.75 million tons seems likely. The fishing season extends from October to May.

Fish Meal and Oil Exports: Fish meal exports for January-September 1959 were 184,090 tons, compared with 76,716 tons in the same period of 1958. An estimate for the 1959 total fish meal exports is now 270,000 tons, compared with 105,777 tons in 1958.

From 1957 to 1959 (data for first 11 months) exports of fish meal by Peru increased over 300 percent. With the increase in fish meal production, exports to countries other than the United States jumped sharply and accounted for 81 percent of the total exports for the first eleven months of 1959. During that period the United States share of Peru's fish meal exports dropped to about 15 percent from 26-27 percent in 1957 and 1958.

Fish oil exports were also up sharply in the January-November 1959 period as compared with both 1958 and 1957. This increase was due to higher production and also to the change made in the established cost of production rate from 460 soles (US$16.81) to a new rate of 3,000 soles (US$110) per ton. The old rate, established about 15 years ago, resulted in excessive export taxes.

Table 1 - Peru's Exports of Fish Meal and Oil, 1957-59 (Total Exports and Exports to U. S.)

	Total Exports			Exports to United States			
	Quantity	Value		Quantity	Value		Percent of Total
	Metric Tons	1,000 Soles	US$ 1,000	Metric Tons	1,000 Soles	US$ 1,000	
Fish Meal:							
1959 (11 mos.)	247,701	1/	1/	36,982	1/	1/	14.9
1958	105,777	271,100	9,909	27,751	69,800	2,551	26.3
1957	61,645	135,000	4,934	16,444	36,100	1,319	26.6
Fish Oil: 2/							
1959 (11 mos.)	15,373	1/	1/	-	-	-	-
1958	1,643	4,500	164	-	-	-	-
1957	4,338	11,400	417	-	-	-	-

1/Values unavailable. 2/No exports to United States.

Note: (1) Values converted at rate of 27.36 soles equal US$1.
(2) Important markets for Peruvian fish meal in 1959: Netherlands (37 percent), Germany (25 percent), United Kingdom (11 percent), and Belgium (8 percent).

Marketing Prospects: As of mid-January, fish meal prices f.o.b. Peruvian ports ranged between US$80 and $90 a metric ton. Despite the low prices, representatives of the fish meal and oil industry are confident of the future and state that there is a strong demand for fish meal in Europe. Recent price trends (January 1960) have shown signs of recovery from the late 1959 low level. These trade representatives state that about 70 percent of the anticipated production of fish meal for 1960 has been contracted for and unsold stocks are low. In addition, they claim that all production as of early 1960 had been sold on contracts for future delivery. (United States Embassy in Lima, January 12, 1960.)

Note: Peruvian soles converted at 27.36 soles equal US$1.

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FISHERIES TRENDS, JANUARY 1960:

The Peruvian fish meal industry has under consideration a proposal for financing, at a cost of 24 million soles (about US$866,000), a new harbor near Callao exclusively for the handling of anchovies for that industry. Most of the fish meal companies favor the proposal and would be willing to participate in financing the new harbor if the port can be administered by representatives of the fish meal companies.

A new plant for smoking fish was due to be activated by the end of January this year. Under the name of "Hornos del Peru," the plant is expected to have an initial capacity of 500 kilos (1,100 pounds) daily, which can be expanded if demand increases. Reportedly, the smoked fish

Peru (Contd.):

product will sell at 12.5 soles a kilo (about 20.5 U. S. cents a pound) as compared with an average price of 25 soles a kilo (41 U. S. cents a pound) for imported smoked fish. (The United States Embassy in Lima reported on January 25, 1960.)

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FISH MEAL PRICES ADVANCED IN LATE FEBRUARY:

In mid-February this year the Manager of the Peruvian National Fisheries Society stated that fish meal buyers were offering US$73-75 a ton f.o.b. Peruvian ports, with no sellers. During the third week of February, buyers offered $78-80 a ton. Reports of low fish meal production in Norway this season (said to be only five weeks long) appear to be responsible for the higher foreign offerings, some of which have come even from Norway.

There have been no developments recently in the organization of an association of Peruvian fish meal producers. The Manager of the Society seems to believe that it will not materialize at least for the present. Fish meal plants of Lima and Callao are temporarily prohibited from using four varieties of edible fish (bonito, machete, caballa, and lorna) in their reduction process. The prohibition extends for four months from February 12, the United States Embassy in Lima reported on February 24, 1960.

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JAPANESE RESEARCH VESSEL VISITS PERU:

The Umitaka Maru, school-vessel of the Fisheries University of Takio, has been making a voyage of scientific and oceanographic investigations, including studies of Peruvian coastal waters. During the voyage, members of the Peruvian National Counsel of Hydrobiological Investigations were aboard. A primary purpose of the visit to Peru was the study of Peruvian fish meal production, with a view of obtaining information to aid in improving Japan's output of that product, the United States Embassy in Lima reported on January 5, 1960.

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Philippines

REPARATIONS COMMISSION REAWARDS JAPANESE-BUILT FLOATING FISH CANNERIES:

The Philippine's Reparations Commission announced on February 18, 1960, that the Japanese-built floating fish canneries and their complement of six fishing boats had been reawarded in separate lots to three different corporations. The boats originally had been awarded to the Estancia (Iloilo) Farrers Cooperative Marketing Association which had not used the boats and had no plans to use them. A packing corporation was awarded the following items: (1) a cannery costing P404,000 ($202,000), which will be stripped off one of the vessels; (2) three fishing boats with a total cost of P860,175 ($430,087); and (3) the P114,000 ($57,000) can manufacturing plant. The vessel which is to be stripped of its cannery equipment was awarded to a shipping company for P1,747,622 ($872,066). A fishery enterprise was awarded the following items: (1) one floating cannery for P2,151,622 ($1,073,603); and (2) three fishing boats with a total of P860,174 ($430,087). (The United States Embassy in Manila reported on February 19, 1960.)

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SHRIMP FISHERY:

According to the most recent statistics available on the landings of shrimp in the Philippines, the catch amounted to about 5.5 million pounds in 1957 and about 8.2 million pounds in 1956. In addition, considerable quantities of shrimp are caught by fishermen engaged in subsistence or personal use fishing which are not included in the statistics.

Practically all of the shrimp caught and landed in the Philippines is consumed within the country. In 1957 the Philippines exported only about 19,000 pounds, valued at US$2,845, and in 1956 about 7,000 pounds, valued at $1,254.

In the Philippines no vessels are known to be engaged exclusively in shrimp fishing, but shrimp are taken along with other fish and shellfish. Most of the catch is sold fresh with the balance usually preserved with salt. (The United States Embassy in Manila reported on December 9, 1959.)

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Poland

FISHING INDUSTRY ACHIEVES 1959 PRODUCTION TARGET:

The Polish State-owned fishing fleet, operating in the North Sea and in the Baltic, achieved its target of 110,000 metric tons for 1959 early in December, according to Polish Marine News, published by the Polish Chamber of Foreign Trade in Warsaw.

The 1959 target for the Polish fishing industry was 146,659 tons of fish--110,000 tons by the State-owned enterprises, 19,668 tons by the cooperatives, and 16,791 tons by private fishermen. The landings for the State-owned enterprises were planned to be 15.9 percent higher than those of 1958.

During the first half of the year the cod landings from the Baltic fishing grounds were 11,000 tons lower than planned, while prolonged storms in October and November made it impossible to achieve the normal good results noted during the herring fishing seasons on the North Sea grounds in the past. However, due to the shortening of the time of repairs to the vessels, the putting into service of the mothership Pulaski, and the establishment of a base at the port of Sunderland during the best herring fishing season (where a total of 3,650 tons of salted herring was landed), the target of landing 110,000 tons of fish by the State-owned enterprises was reached on December 4. The value of the fish landed was higher by 4.5 percent than planned.

Polish State-Owned Fishing Fleet Landings

Species	1959 1/	1958
	(Metric Tons)	
Cod	19,996	25,051
Herring (North Sea)	68,735	55,322
Herring (Baltic)	8,793	9,488
Sprats	7,902	2,769
Salmon	25	20
Mackerel	3,861	1,796
Flat fish	130	180
Other salt-water fish	570	265
Total	110,012	94,891

1/ Up to December 4.

The report continues, "The deep-sea fishery was influenced by the actual requirements of the market and for this reason the landings of salted herring for the home market amounted to 95 percent of the total landings, the remaining 5 percent being white fish and mackerel. The deep-sea fleet in practice fishes herring from April to November, fishing in the remaining 4 months having been discontinued."

During the period from January up to the end of November the State-owned fishing flotilla consisted of 39 large trawlers, 15 trawlers, 50 drifter trawlers, 3 drifters, 74 cutters, 154 56-foot cutters, and 14 49-foot cutters.

To organize fishing all the year round, as well as to increase the landings from distant waters, the existing fishing fleet is being modernized and up-to-date factory trawlers are being built.

To increase the operating range of the coal burning steam-trawlers they are being reconstructed into fuel-oil burners; to improve safety conditions on the North Sea grounds, the vessels are being equipped with radar. The first factory-trawler will be handed over by the Gdansk shipyard in 1960. Thus the distant-water fishing fleet will be able to supply large quantities of fresh and frozen fish for the home market in the near future. (The Fishing News, January 29, 1960.)

Portugal

CANNED FISH EXPORTS, JANUARY-OCTOBER 1959:

Portugal's exports of canned fish during January-October 1959 amounted to 60,966 metric tons (3,327,000 cases), valued at US$31.3 million as compared with 53,725 tons, valued at US$28.6 million for the same period in 1958. Sardines in olive oil exported during the first ten months of 1959 amounted to 45,415 tons, valued at US$22.0 million.

Portuguese Canned Fish Exports, January-October 1959

Species	Metric Tons	US$ 1,000
Sardines in olive oil	45,415	22,033
Sardine & sardinelike fish in brine	1,303	268
Tuna & tunalike fish in olive oil	3,410	2,382
Anchovy fillets	5,367	3,933
Mackerel in olive oil	3,064	1,531
Other fish	2,407	1,163
Total	60,966	31,310

Portugal (Contd.):

During January-October 1959, the leading canned fish buyer was Germany with 13,465 tons (valued at US$6.8 million), followed by Italy with 8,814 tons (valued at US$5.0 million), United States with 5,752 tons (valued at US$3.9 million), Great Britain with 5,601 tons (valued at US$2.6 million), and France with 3,843 tons (valued at US$2.0 million). Exports to the United States included 2,162 tons of anchovies, 822 tons of tuna, 2,564 tons of sardines, and 38 tons of mackerel. (Conservas de Peixe, December 1959.)

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CANNED FISH PACK, JANUARY-OCTOBER 1959:

The total pack of canned fish for January-October 1959 amounted to 48,147 metric tons as compared with 46,580 tons for the same period in 1958. Canned sardines in oil (36,790 tons) accounted for

Portuguese Canned Fish Pack, January-October 1959

Product	Metric Tons1/	1,000 Cases
In Olive Oil:		
Sardines	36,790	1,936
Sardinelike fish	562	29
Anchovy fillets	4,711	471
Tuna	4,295	154
Mackerel	563	22
Other species	1,226	65
Total	48,147	2,677

1/Net weight.

76.4 percent of the January-October 1959 total pack, up by 17.9 percent from the pack of 31,198 tons for the same period of 1958, the December 1959 Conservas de Peixe reports.

Spain

VIGO FISHERIES TRENDS, OCTOBER-DECEMBER 1959:

Fish Exchange: Fish landings for the fourth quarter of 1959 totaled 23,280 metric tons, an increase of 1,644 tons over the third quarter and 453 tons over the fourth quarter of 1958.

The total value of the catch for the fourth quarter calculated in U. S. dollars (at 60 pesetas to the dollar) was $3,197,017 as compared with $3,723,000 for the third quarter of 1959 and $4,409,039 for the fourth quarter of 1958 (calculated at the 1958 official rate of exchange of 42 pesetas to the dollar).

The increase in landings for the fourth quarter of 1959 as compared with the same quarter of 1958 is attributed to the very successful sardine season, which more than compensated for the poor over-all landings in December because of bad weather. The sardine landings for the fourth quarter totaled 11,186 tons, almost double the 5,660 tons landed in the fourth quarter of 1958. The sardine catch for the third quarter of 1959 was 5,574 tons. Other important species landed in the fourth quarter of 1959 were small hake, horse mackerel, and pomfret, the latter increasing from 759 tons in the final quarter of 1958 to 1,757 tons in October-December 1959.

Landings of the highly-favored hake dropped from 259 tons in the fourth quarter of 1958 to 119 tons in the corresponding quarter of 1959, with the average price per kilo rising from 45.73 pesetas to 63.30 (45.4 to 47.8 U.S. cents a pound).

The average price per kilo at the Exchange for the total catch was 8.33 pesetas (6.3 U.S. cents a pound) in the fourth quarter of 1959 as compared with 10.32 pesetas (7.8 U.S. cents a pound) for the third quarter and 8.11 pesetas (8.8 U.S. cents a pound) for the fourth quarter of 1958. The spread between the average price in the third and fourth quarters was due to the scarcity of the high-priced albacore and the higher landings of the low-priced sardines in the fourth quarter of 1959.

Preliminary estimates for the 1959 landings at Vigo give a total of 77,264 metric tons, with a value of 790,920,000 pesetas (US$15,508,000 at average rate of 51 pesetas to US$1), an increase over the 1958 total of some 13,000 metric tons and 173,979,000 pesetas (US$3,411,000). The 1959 increase, due largely to the increased sardine catch, reversed a trend in recent years of declining landings at Vigo.

Fish Canning and Processing: The fish canning industry purchased 3,766 tons of fresh fish from the Vigo Fish Exchange during the fourth quarter of 1959, as compared with 6,575 tons for the third quarter, and 5,260 tons for the fourth quarter of 1958. For 1959, the total purchased by the canning industry was 12,583 tons, slightly under the 12,807 tons purchased in 1958.

Other processors, including smokers, driers, and fishmeal plants purchased 5,569 tons during the fourth quarter of 1959, in contrast with 3,467 tons during the third quarter and 3,568 tons during the fourth quarter of 1958. The total for 1959 was 14,386 tons, more than double the 6,672 tons purchased from the Exchange during 1958.

Canning activity fell off during the fourth quarter, and was lower than the activity of the final quarter of 1958 largely due to the shortage of sardines of a quality suitable for canning. Although the sardine catch was unusually large during the quarter, it was, for the most part, small size fish purchased by the fish-meal factories. It was the abundance of small sardines at very low prices throughout the late summer and the fall of 1959 that was largely responsible for the greatly increased purchases by "other processors."

Exports: Although the canners have had a very successful year in the export market, sales to the domestic market are reported to be down. While no figures are available to substantiate these reports, it has been estimated by a reliable source that shipments of canned fish to the large consuming centers of Madrid and Barcelona during October-December 1959 were down 60 percent from the corresponding period of 1958.

No figures on canned fish exports for 1959 from the northwest region are available. However, an official of the Ministry of Commerce believes the total volume of exports will be double that for 1958. Of significant importance were increased exports of canned albacore tuna to the United States. One of the largest Vigo canners stated that his exports to the United States (almost entirely albacore) were five times greater in volume than in 1958, and asserted that he could easily double the 1959 figure if albacore catches are more plentiful in 1960.

The canners' optimism over the future of the export market is dependent upon a continued and increasing supply of fish. While the devaluation of the peseta and the liberalization of tinplate importations have virtually eliminated, for the time being at least, the perennial problems of noncompet-

Spain (Contd.):

itive prices and tinplate shortages, the major problem of an inadequate fishing fleet will probably prevent the canning industry from utilizing its full capacity for export for some time to come.

Cod Market: In the middle of December 1959, the Commissariat of Supply and Transportation published an order (Boletin Oficial del Estado, Dec. 15, 1959) canceling all controls on the prices of cod, for all sizes and species. Previously, only prices on large cod (an estimated 20 percent of the total catch) were free.

The cod industry has long sought the end of government controls on the price of cod. It remains to be seen whether import competition or consumer resistance will be effective in keeping cod prices down. In view of the reportedly poor catches by the Spanish cod fleet in recent months, it is likely that the large cod companies will attempt to raise their prices.

Sweden

HERRING LANDINGS HIGHER IN 1959:

Landings of herring by Swedish fishermen at home and abroad in 1959 are estimated at about 115,000 metric tons, a considerable increase as compared with the 97,000 metric tons landed in 1958. Landings in foreign ports accounted for the larger part of the increase. In Danish ports, Swedish fishermen landed herring and other fish totaling 69,000 tons as compared with 61,900 tons in 1958. The value of the landings in Danish ports in 1959 was 31,033,000 crowns (US$5,996,700) as compared with 26,631,000 crowns (US$5,146,000) in 1958. Of the landings in Danish ports in 1959, food fish other than herring accounted for a very small portion. Industrial fish, however, made up about one-third of the landings, or about 20,000 tons, valued at 3,948,000 crowns (US$762,900). In 1958, the industrial fish landed in Danish ports totaled 14,000 tons valued at 2,309,000 crowns (US$446,200).

Direct landings of herring in West German ports by Swedish fishermen, which in 1958 dropped considerably, amounting to only about 25 percent of the landings in 1957, increased in 1959 by almost 500 percent and totaled 7,384 tons, valued at 4,248,000 crowns (US$820,900). In addition, 500 tons of other fish valued at 288,000 crowns (US$55,700) were landed in West German ports. The total landings of herring and other fish in West German ports in 1958 amounted to 1,576 tons, valued at 1,163,000 crowns (US$224,700).

Swedish direct landings of herring in Great Britain, however, continued the downward trend from 1958 and amounted in 1959 to 1,733 tons valued at 852,000 crowns (US$164,600). In addition, 147 tons of other fish valued at 88,000 crowns (US$17,000) were landed in British ports. The total landings in 1958 amounted to 2,600 tons, valued at 1,573,000 crowns (US$304,000).

Data on the total value of Sweden's landings of fishery products is unavailable. But a considerable increase in value as compared with 1958 is expected. The value of the landings in foreign ports in 1959 exceeded the 1958 value by about 7,000,000 crowns (US$1,352,700). In addition, the turnover in 1959 at the major fish auctions on the Swedish west coast was larger than in 1958. (The United States Embassy in Goteborg reported on February 18, 1960.)

Thailand

SHRIMP INDUSTRY:

The shrimp fishing industry in Thailand consists of many small enterprises scattered along the coast and also inland for fresh-water shrimp. Most of the catch, which is estimated to have averaged about 10,370 metric tons annually for 1956-58, is consumed in Thailand. Small quantities of both fresh, frozen, or dried shrimp are exported (exports varied between 10 tons in 1956 to about 40 tons in 1958 for all types). In 1958, export of frozen shrimp (less than 200 pounds) to the United States was started on an experimental basis. In 1959, according to estimates, frozen shrimp exports to the United States from the Port of Bangkok rose to 23.9 tons, valued at about US$29,868.

Late in 1959 there were three companies exporting shrimp from the Bangkok area. All three firms used the cold-storage facilities of the semi-Government-owned and operated Cold Storage Organization in Bangkok. Only one of the firms (Japanese) handling and processing shrimp for export has specialized equipment for shrimp fishing.

Most of the shrimp catch is made during the dry season, although shrimp stocks are believed to be available throughout the year. The catch is confined largely to coastal waters, especially in the southern part of Thailand where the largest quantities are caught.

Thailand (Contd.):

In 1957, powered vessels 5 net tons and under totaled 482 and vessels over 5 net tons amounted to 273 for a total tonnage of 5,688. Mechanized fishing vessels increased sharply in number and tonnage in 1958 consisted of 647 vessels of 5 net tons and under and 943 vessels over 5 net tons for a total tonnage of 18,318. In addition, in 1958 there were 601 vessels without power averaging about 6 tons in size. No vessels are used exclusively for shrimp fishing, and a fair portion of the annual shrimp catch is taken by stationary fishing gear, such as bag nets. The Thai Department of Fisheries has a program to provide loans at low interest rates for fishermen to purchase fishing gear and motors. Most of the fishing enterprises are family undertakings, and more and more of the vessels are being mechanized.

Prices paid for shrimp at the auction held by the Fish Marketing Organization in Bangkok from January-September 1959 averaged 42.5 U. S. cents a pound for large shrimp and 24.7 U. S. cents a pound for small shrimp. The price range for large shrimp was from 38.9 to 49.7 (January) and from 21.6 to 26.1 (July) U. S. cents a pound for small shrimp.

Costs of processing shrimp for export based on purchase prices ranging between 30 and 48 U. S. cents a pound are as follows: processing, US$5.71 a ton; cold-storage, first month $39 a ton, second month $32 a ton; transportation to harbor, $23.80 a ton. Total costs to point of shipment ranged from 33.6 to 50.8 U. S. cents a pound. (United States Embassy in Bangkok, December 22, 1959.)

Note: Values converted at rate of 21 Bahts equal US$1.

Tunisia

FISHERIES EXPANSION PROMOTED BY GOVERNMENT:

The Tunisian Government-supported Office National des Peches (ONP) continued to expand its activities during the final quarter of 1959, including acquisition of the important tuna fishery and cannery of Sidi Daoud, the "Societe des Madragues Tunisiennes." This French company, according to the Director of ONP, had been given a concession to exploit the major tuna fishing areas until 1990. In 1958, the company's rights in the Monastir area were taken away by order of the President of Tunisia because of its failure to exploit that sector of its concession. Purchase of the Sidi Daoud Company and acquisition of the extensive tuna fishing rights has been presented by the ONP as an opportunity to expand tuna production to meet domestic demand and to give more employment to Tunisians by keeping the Sidi Daoud fishery open for all or most of the year. It is proposed that production be increased in fishing areas formerly used but abandoned in recent years, commencing with Cap Zebib in 1960, and by employing a 30 meter (98.4 foot) vessel (expected to be completed by the end of 1960) to fish for tuna in the winter months when the fish are not found close to land.

The ONP, already enjoying a virtual monopoly in the relatively profitable lake (or lagoon) fishing and operating some seven trawlers, also moved ahead with plans to build a modern sardine cannery at Sousse. It has also made important progress in its declared goal of establishing a "chain of cold" from the site of the catch to the consumer. Refrigerated trucks are already in operation from the major fishery at El-Biban in the south to Tunis; on January 14 a complex of four refrigerated storage rooms was opened in Tunis Central Market with a capacity of between 20-25 tons. The ONP Director has described the new facility both as a protection to the consumer's health and a facility to control the price of fish. By releasing from cold storage only enough fish to meet consumer demand, it is possible to avoid glutting the market and a subsequent drop in prices. (United States Embassy in Tunis reported on February 4, 1960.)

Union of South Africa

FISH MEAL PRODUCERS SEEK AGREEMENT WITH PERU:

The emergence of Peru as a major fish meal producer has been a source of concern to the South African fish meal and oil industry. Peruvian production is now estimated to be in excess of 200,000 long tons a year and is expected to increase to about 300,000 tons in 1960. The impact of Peruvian production on the world market for fish meal is evidenced by the fact that prices in the United Kingdom have dropped from £57-12-0 (US$161.28) to £43-2-0 ($120.68) per long ton in the past four months. This trend has in fact become

Union of South Africa (Contd.):

so disturbing that two representatives of South African fish meal producers visited Peru seeking a marketing, pricing, and production agreement with the Peruvian industry. South African production of fish meal in 1958 amounted to 102,579 tons of which 89,253 tons were exported. Both South Africa and South-West Africa had record catches of pilchards in 1959. (United States Embassy in Pretoria reported on January 25, 1960.)

U.S.S.R.

EXPANSION OF FISHING FLEETS CONTINUES:

The latest addition to the Soviet Union's Baltic fishing fleet is the mothership Svjatogor, which was operating in the Atlantic in December 1959, according to a report in the Soviet publication Vodnyj Transport of December 1959. The vessel is equipped with a helicopter and, in addition to its primary objectives, serves as a base ship for fishing vessels and fishermen, reports on the weather, and scouts for fish schools. The mothership uses the helicopter to deliver mail to the fishing vessels from ships coming from Russian home ports.

The herring factoryship Lamut, of 4,982 gross tons, has been built for the Soviet Union by a Japanese shipyard. The new vessel is part of a larger order placed with Japanese shipyards, which also includes two vessels for tuna fishing, the Dnepr and Dnestr, and another factoryship for the herring fishery, the Nicholai Isaenko.

The Lamut has a production capacity of 120 metric tons of herring per 24 hours and is equipped for both salting and freezing herring or other species. This vessel is well equipped for the comfort of the crew. It has a surgical clinic with an x-ray room, and recreation space with piano, movies, library, and other conveniences. The vessel is 110 meters long over-all, 16 meters in breadth, 9 meters deep, is equipped with a 3,360-hp. engine, and had a maximum speed of 14.6 knots on its trial trip. (Fiskets Gang, January 21, 1960.)

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FISHING FLEET OPERATING OFF ALASKA:

A Russian fishing fleet was reported operating in the North Pacific off Alaska in full force about a month earlier than usual. At least 50 Russian trawlers and 10 refrigerator and support ships were spotted in the area late in January off the southeast coast of Nunivak Island which is north of Bristol Bay and not far from the Yukon River. The fleet apparently is equipped for bottom fishing for such species as cod, flounder, and sole. Stern-type trawlers were sighted in the fleet.

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LARGE FLEET OF VESSELS FISHING FOR HERRING OFF FAROE ISLANDS:

The Soviet Union's fishing fleet has been averaging a catch of 1,450 metric tons of herring a day off the Faroe Islands recently, according to a report in a Swedish fisheries publication (January 10, 1960). It is estimated that 300-400 Russian vessels are fishing off the Faroe Islands. They are led by almost a score of supply and motherships of about 7,000-8,000 tons each, and tankers. The tankers regularly obtain fresh water in the port of Thorshavn, Faroe Islands, usually 1,000 tons at a time. One of the Russian motherships is equipped with a helicopter. (Fiskets Gang, January 28, 1960.)

United Kingdom

CONTRACT FOR FISH AT FIXED PRICES FOR FREEZING:

A contract for the purchase of supplies of fresh fish valued at £450,000 (US$1,260,000) was due to be signed late in January 1960 by a large Grimsby, England, processor of quick-frozen fish and other foods. The fish, to be delivered from February 1960 to the end of July 1960, will be obtained from Grimsby and Hull distant-water trawler owners. Un-

United Kingdom (Contd.):

der the contract about £3 (US$8.40) a kit of 140 pounds (6 U. S. cents a pound) will be paid for fish received. The contract amounts to about 10,000 metric tons.

Another contract for the bulk purchase of fish valued at £1 million (US$2,800,000) was recently signed by another large Grimsby fishing and processing company. It is understood that a third Grimsby packaged fish firm is negotiating for the purchase of 980,000 pounds of fish at a fixed price.

In 1959 for the first time, fish was sold by trawler owners at fixed prices rather than by auction, as was the custom in the past. The present contracts tend to indicate that as the fish-freezing trade continues to develop, the practice of selling fish under contract at fixed prices is growing.

One of the large packers of quick-frozen fish and other products states that a smaller series of contracts of this nature in 1959 were successful. The firm claims that the agreement will produce dual benefits in the way of high-quality fish at steady prices for the consumer, and a stable market for the trawler owners and their crews. Another important aspect of the signing of the contracts is that the processor is able to quick-freeze as much fish as possible while it is in season. (United States Embassy in London reported on January 22, 1960.)

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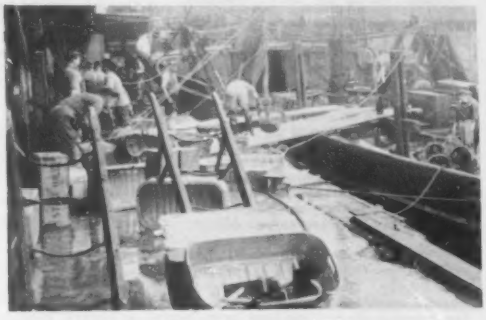
"SILVER COD" FOR 1959 AWARDED TO HULL VESSEL:

The 1959 "Silver Cod" trophy for 1959 has been awarded to the Hull distant-water trawler Falstaff. In 330 days at sea this vessel landed a total of 39,695 kits or about 5.6 million pounds of fish. The first seven of the eight high-liner vessels for 1959 were from Hull, which is England's main fishing port for large distant-water trawlers.

Landings by Eight Leading British Vessels in Silver Cod Competition

Vessel	Days at Sea	Landings	
		Kits (140 Lbs.)	1,000 Lbs.
Falstaff	330	39,695	5,557
Arctic Ranger .	333	37,490	5,249
Prince Charles	336	35,709	4,999
Cape Trafalgar	336	34,933	4,891
Marbella . . .	331	34,818	4,875
Kirkella . . .	334	34,769	4,868
Caesar	343	34,181	4,785
Northern Eagle	333	33,365	4,671



Unloading a fishing trawler at Grimsby, England. Note movable winch on dock and gang planks on which baskets are pushed down to dock.

The skipper of the Falstaff stated that the vessel's speed was a great advantage in winning the award for 1959. He also stated that the Falstaff was a very seaworthy vessel, which enabled the vessel to fish in weather when less able vessels were forced to cease fishing. (The Fishing News, January 22, 1960.)

Viet-Nam

SHRIMP INDUSTRY:

The average annual catch of shrimp for 1956-1959 is estimated by the Viet-Nam Directorate of Fisheries at 5,000 metric tons. There are no data concerning the species and value of shrimp taken. At the January 1960 average ex-vessel price of 27.5 piasters per kilogram, an annual catch of 5,000 metric tons would be worth 137,500,000 piasters, or US$3,928,571 at the official rate of exchange of 35 piasters per U. S. dollar.

The Directorate of Fisheries estimates that there are more than 2,000 boats engaged in fishing for shrimp at one time or another during the year. The boats vary in size, but are mostly very small craft powered by sail and oars. A few fishing boats now have gasoline engines.

There are presently no construction programs for shrimp fishing vessels. A new Vietnamese firm organized to catch, freeze, and export shrimp, plans to have five Japanese-built vessels, of 75 to 150 tons, with Diesel power, by the end of 1960. This firm is only now beginning commercial operations. Initial production is expected to be about 600,000 pounds a month. Exports, at least at first, will be made only to the United States. According to reports, the first shipment of frozen shrimp to the United States will be made early in 1960.

Ex-vessel prices for shrimp in Saigon in January 1960 were 30-35 piasters per kilogram (about 38.9-45.4 U. S. cents a pound at official rate of exchange) for large shrimp

Viet-Nam (Contd.):

and 20-25 piasters per kilogram (25.9-32.4 U. S. cents a pound) for small shrimp. Shrimp are sold only by size, never according to species.

Since 1956 small quantities of dried shrimp have been exported from Viet-Nam. The current market price for dried shrimp exported to Hong Kong and Singapore is 24.14 piasters per kilogram or about 31.3 U. S. cents a pound. Exports of dried shrimp from 1956-59 averaged about 37.5 metric tons per year with about 67.7 percent exported to Hong Kong, 26.7 percent to Singapore, and about 10.7 percent to other destinations.

There are no current export controls (except as part of general licensing of all exports) or taxes on exports of fresh shrimp. Dried shrimp must pay an export tax of 5 percent ad valorem. Earnings of foreign exchange from exports of shrimp must, as is true of all exports, be exchanged for piasters, 65 percent at the official rate of 35 piasters per dollar, and 35 percent at the free rate of approximately 72 piasters per dollar.

The relatively small annual shrimp landings made from Vietnamese waters are not an indication of the available supply. Most shrimp are now caught in shallow coastal waters, bays, and rivers mouths. Deep-water fishing grounds for shrimp have been located at several places off the coast, and it appears that there is a plentiful supply of two or three large species. (United States Embassy in Saigon, January 11, 1960.)

* * * * *

EXPORT OF FROZEN SHRIMP TO UNITED STATES STARTED:

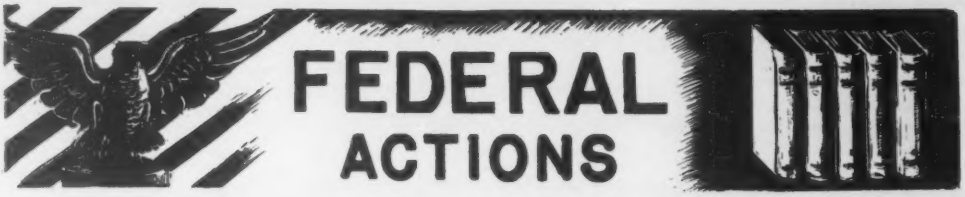
On January 24, 1960, a new Vietnamese shrimp fishing and processing company made its first shipment of quick-frozen shrimp to the United States. The shipment (due in New York about March 10) of ten metric tons, packed 5-pounds to the carton, was expected to bring about 70 U. S. cents a pound in New York. Less freight charges, the shipment should net the new firm about US$13,628. For the near future, the company hopes to ship about 30 tons a month. The company's freezing capacity is 60 tons a month, but it is still plagued with difficulties in securing adequate supplies of raw shrimp. At 30 tons a month, foreign exchange earnings for Viet-Nam would approach US$500,000 a year. The company's present intention is to sell the entire production in the United States.

The company is now actively seeking two special shrimp trawlers from Florida or Japan to improve raw shrimp landings. It has also recently sent a sample shipment to New York of special shrimp, found near Soo-Trang on the southern mouth of the Mekong. These shrimp, believed to be unique, have tails 6-8 inches in length. The New York importer's response to the sample was said to be enthusiastic. As an added inducement, the heads (carapaces) are said to be marketable locally for soups. (United States Embassy in Saigon, February 1, 1960.)

CORRECTION

In the article entitled "Report of the Tenth Session of the FAO Conference," the paragraph beginning at the bottom of the second column of page 52 (February 1960 issue of Commercial Fisheries Review) should have read:

Two major proposals by the U. S. Delegation for world conferences were accepted and written into the report of the Technical Committee. The first proposal, dealing with a world conference on the tunas and related species, was received favorably by all delegates; the suggestion was made that the conference be held in Hawaii, because it is a major center for research on tunas, and has excellent facilities for a conference. The other proposal, dealing with a symposium on the nutritive value of fishery products, was also received favorably, and the Committee requested the Director-General to go into the possibility of organizing this symposium as a joint activity of the Fisheries and Nutrition Divisions, subject to the availability of funds.



Department of the Interior

FISH AND WILDLIFE SERVICE

BUREAU OF COMMERCIAL FISHERIES

BREADED FISH PORTIONS AND COD FILLETS VOLUNTARY GRADE STANDARDS ISSUED:

Voluntary grade standards for the production of good quality frozen raw breaded fish portions and cod fillets have been approved. The grade standards were published in the Federal Register of February 27, 1960, and became effective 30 days from that date. Notice of intention to establish standards for frozen cod fillets was carried in the Federal Register on November 21, 1959, and for frozen raw breaded fish portions in the Federal Register of December 5, 1959.

The standards were developed by the U. S. Bureau of Commercial Fisheries, after months of research. Well-advertised public meetings in Boston, Chicago, and Seattle, were attended by interested industry groups and by consumer representatives. Suggestions made were given full consideration and in many instances adopted. Acceptance on the part of individual firms is entirely voluntary. Those who use the USDI continuous inspection service will have the right to mark individual packages to convey this fact to the buyer.

The proposed regulations include product and grade description; factors of quality, including evaluation of flavor, odor, appearance, size, absence of defects, and character; definitions and methods of analysis; lot certification tolerances; and score sheets.

Standards have already been established for frozen fish sticks, fish blocks, breaded shrimp, haddock fillets, and halibut steaks. It is anticipated that grade standards will be established by midsummer for the production of raw headless shrimp and ocean perch fillets.

In 1959, 29 processing firms produced about 95 million pounds of fishery products. These firms have the right to use the Department of the Interior shields of quality showing "continuous inspection" and additional firms have availed themselves of the lot-sampling service and have had their products certified as being part of a lot which was officially sampled by Bureau inspectors.

Title 50—WILDLIFE

Chapter I—Fish and Wildlife Service, Department of the Interior

SUBCHAPTER K—PROCESSED FISHERY PRODUCTS, PROCESSED PRODUCTS THEREOF, AND CERTAIN OTHER PROCESSED FOOD PRODUCTS

PART 176—UNITED STATES STANDARDS FOR GRADES OF FROZEN RAW BREADED FISH PORTIONS [1]

On page 9787 of the FEDERAL REGISTER of December 5, 1959, there was published a notice of a proposed new part 176 of Title 50, Code of Federal Regulations. The purpose of the part is to issue United States Standards for Grades of Frozen Raw Breaded Fish Portions under the authority transferred to the Department of the Interior by section 6(a) of the Fish and Wildlife Act of August 8, 1956 (16 U.S.C. 742e).

Interested persons were given 30 days within which to submit written comments, suggestions or objections with respect to the proposed new part. Comments were received and considered and the proposed new part is hereby adopted without change and is set forth below. This amendment shall become effective at the beginning of the 30th calendar day following the date of this publication in the FEDERAL REGISTER.

Dated: February 23, 1960.

ELMER F. BENNETT,
Acting Secretary of the Interior.

PRODUCT DESCRIPTION AND GRADES

Sec.
176.1 Product description.
176.2 Grades of frozen raw breaded fish portions.

FACTORS OF QUALITY

176.11 Ascertaining the grade.
176.12 Evaluation of the unscored factor of flavor and odor.
176.13 Evaluation and rating of the scored factors: Appearance, uniformity, absence of defects, and character.
176.14 Appearance.

[1] Compliance with the provisions of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

176.15 Uniformity.
176.16 Absence of defects.
176.17 Character.

DEFINITIONS AND METHODS OF ANALYSIS

176.21 Definitions and methods of analysis.

LOT CERTIFICATION TOLERANCES

176.25 Tolerances for certification of officially drawn samples.

SCORE SHEET

176.31 Score sheet for frozen raw breaded fish portions.

AUTHORITY: §§ 176.1 to 176.13 issued under sec. 6(a), Fish and Wildlife Act of August 8, 1956; 16 U.S.C. 742e.

PRODUCT DESCRIPTION AND GRADES

§ 176.1 Product description.

Frozen raw breaded fish portions are clean, wholesome, uniformly shaped unglazed masses of cohering pieces (not ground) of raw fish flesh coated with suitable, wholesome batter and breading. They are packaged and frozen in accordance with good commercial practice and are maintained at temperatures necessary for the preservation of the product. The frozen raw breaded fish portions are at least 3/8-inch thick and contain the minimum fish flesh content specified in § 176.21(a). The portions in an individual package are prepared from the flesh of only one species of fish.

§ 176.2 Grades of frozen raw breaded fish portions

(a) "U.S. Grade A" is the quality of frozen raw breaded fish portions that possess good flavor and odor; and for those factors of quality which are rated in accordance with the scoring system outlined in this part the total score is not less than 90 points.

(b) "U.S. Grade B" is the quality of frozen raw breaded fish portions that possess at least reasonably good flavor and odor; and for those factors of quality which are rated in accordance with the scoring system outlined in this part the total score is not less than 70 points.

(c) "Substandard" is the quality of frozen raw breaded fish portions that fail to meet the requirements of U.S. Grade B.

FACTORS OF QUALITY

§ 176.11 Ascertaining the grade.

(a) The grade of frozen raw breaded fish portions is ascertained from the evaluation of a sample unit consisting of ten frozen raw breaded portions selected at random from one or more packages as necessary. The evaluation of the quality factors is made from the examination of the product in the frozen state and after it has been cooked in a suitable manner. The following factors are evaluated in ascertaining the grade of the product: Flavor and odor, appearance, uniformity, absence of defects, and character. These factors are rated in the following manner:

(1) *Flavor and odor.* These factors are rated directly by organoleptic examination. Score points are not assessed (see § 176.12).

(2) *Appearance, uniformity, absence of defects, and character.* The relative importance of these factors is expressed numerically on the scale of 100. The maximum number of points that may be given each of the factors are:

Factors	*Points*
Appearance	25
Uniformity	20
Absence of defects	40
Character	15
Total possible score	100

§ 176.12 Evaluation of the unscored factor of flavor and odor.

(a) *Good flavor and odor.* "Good flavor and odor" (essential requirements for a Grade A product) means that the product has good flavor and odor characteristic of the indicated species of fish and of the type of coating used; and is free from staleness, and off-flavors and off-odors of any kind.

(b) *Reasonably good flavor and odor.* "Reasonably good flavor and odor" (minimum requirement of a Grade B product) means that the product may be somewhat lacking in good flavor and odor; and is free from objectionable off-flavors and off-odors of any kind.

§ 176.13 Evaluation and rating of the scored factors: Appearance, uniformity, absence of defects, and character.

The essential variations in quality within each factor which is scored are so described that the value may be ascertained for each factor and expressed numerically. Point deductions are allotted for each degree or amount of variation within each factor. The net score for each factor is the maximum points for that factor less the sum of the deduction-points within the factor. The total score for the product is the sum of the net scores for the four scored factors.

§ 176.14 Appearance.

(a) The factor of appearance refers to the amount of loose breading and frost in the packaged product, and lack of continuity of the coating of the frozen product.

(1) *Loose breading and frost.* "Loose breading" refers to that amount of breading material (crumbs) found free in the package. "Frost" refers to the frozen moisture which is deposited on the product as a white crystalline coating, and which accumulation is objectionable and can be readily removed.

(2) *Continuity.* "Continuity" refers to the coverage of the fish flesh by the coating. Lack of continuity in the frozen state is exemplified by breaks (bare spots, or sections of thin coating through which the fish flesh is slightly visible), ridges (excess breading which projects at the edges of the frozen portion), lumps (objectionable outcropping of the breading on the surface of the frozen portion), and/or depressions (objectionable visible voids or shallow areas in the surface of the portion which are lightly covered by breading). Each 1/8-square-inch area of any break, ridge, lump, or depression is considered an instance of "lack of continuity". Individual breaks, ridges, lumps, or depressions measuring less than 1/8 square inch are not considered.

(b) For the purpose of rating the factor of appearance, the schedule of deduction-points in Table I apply. Frozen raw breaded fish portions which receive 25 deduction points for the factor of appearance shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

TABLE I—SCHEDULE OF POINT-DEDUCTIONS FOR VARIATIONS IN APPEARANCE

Appearance subfactors	Method of determining subfactor score (percent of net weight)		Deduction points
	Over	Not over	
Loose breading and frost.	0	½	0
	½	1	1
	1	2	3
	2	5	5
	5	10	10
	Lack of continuity	Number of portions affected	
Continuity	(a) Slight (8 to 16 instances per portion).	1	½
		2 or 3	1
		4 or 5	2
		6 or 7	3
		8 to 10	5
	(b) Moderate (17 to 20 instances per portion).	1	1
		2 or 3	3
		4 or 5	5
		6 or 7	7
		8 to 10	10
	(c) Severe (over 20 instances per portion).	1	2
		2 or 3	6
		4 or 5	10
		6 or 7	15
		8 to 10	25

§ 176.15 Uniformity.

(a) The factor of uniformity refers to the degree of conformance of the length, width, and weight of each individual frozen portion to the average length, width, and weight of the portions within a sample unit.

(b) For the purpose of rating the factor of uniformity, the schedule of deduction-points in Table II apply. Frozen raw breaded fish portions which receive 20 deduction-points for the factor of uniformity shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

TABLE II—SCHEDULE OF POINT-DEDUCTIONS FOR VARIATIONS IN UNIFORMITY

Method of determining subfactor score	Number of portions affected	Deduction points
Lack of uniformity		
(a) Slight—Portions deviating ±10.1 to 15 percent from average sample weight, or ±1/16 to 3/16 inch from average sample length, or ±1/16 to 3/16 inch from average sample width.	1	0
	2 or 3	1
	4 or 5	3
	6 or 7	5
	8 to 10	7
(b) Moderate—Portions deviating ±15.1 to 20 percent from average sample weight, or more than 3/16 and up to 5/16 inch from average sample length, or more than 3/16 and up to 5/16 inch from average sample width.	1	1
	2 or 3	3
	4 or 5	5
	6 or 7	7
	8 to 10	10
(c) Severe—Portions deviating over 20 percent of average sample weight, or more than 5/16 inch from average sample length, or more than 5/16 inch from average sample width.	1	3
	2 or 3	5
	4 or 5	9
	6 or 7	15
	8 to 10	20

§ 176.16 Absence of defects.

(a) The factor of "absence of defects" refers to the degree of freedom from broken portions, damaged portions, lack of adherence, blemishes, and bones. Evaluation of the defects of broken and damaged portions are made on the frozen product. Evaluation of the de-

fects of adherence, blemishes, and bones are made after the product has been cooked in a suitable manner.

(1) *Broken portion.* "Broken portion" means a portion with a break or cut greater than ½ the width or length of the portion.

(2) *Damaged portion.* "Damaged portion" means a portion which has been injured, mashed, or mutilated to the extent that its appearance is materially affected. The amount of damage to a portion is measured by the percentage of the portion affected.

(3) *Adherence.* "Adherence" refers to the adhesion of the coating material (batter and breading) to the fish flesh of the cooked product. Lack of adherence is characterized by a swelling and subsequent bursting of the coating of the cooked product, resulting in exposure of the fish flesh. The degree of nonadherence is measured by the size of the break in the cooked coating. Each ¼ square inch break in the coating showing exposed fish flesh is considered an instance of "lack of adherence".

TABLE III—SCHEDULE OF POINT-DEDUCTIONS FOR ABSENCE OF DEFECTS

Defect subfactors	Method of determining subfactor score	Number of portions affected	Deduction points
Broken portions.	Break or cut greater than ½ the width or length of the portion.	0	0
		1	1
		2	3
		3	12
		4 to 10	40
	Degree of damage		
Damaged portions.	(a) Slight—Affecting over 5 but less than 25 percent of the surface area of the individual portion.	1 or 2	2
		3 to 5	5
		6 to 10	10
	(b) Moderate—Affecting over 25 but less than 50 percent of the surface area of the individual portion.	1 or 2	4
		3 to 5	10
		6 to 10	20
	(c) Severe—Affecting 50 percent or more of the surface area of the individual portion.	1 or 2	8
		3 to 5	20
		6 to 10	40
	Lack of adherence		
Adherence	(a) Slight (1 instance per portion).	1	1
		2 or 3	3
		4 or 5	5
		6 or 7	7
		8 to 10	10
	(b) Moderate (2 or 3 instances per portion).	1	3
		2 or 3	7
		4 or 5	12
		6 or 7	18
		8 to 10	30
	(c) Severe (4 or more instances per portion).	1	5
		2 or 3	10
		4 or 5	18
		6 or 7	30
		8 to 10	40
	Number of instances per sample unit (not over 10 instances are recorded per portion)		
Blemishes	1 or 2		1
	3 or 4		2
	5 or 6		4
	7 or 8		6
	9 or 10		8
	11 or 12		11
	13 or 14		15
	15 or 16		20
	17 or 18		25
	19 or 20		32
	21		40
	Number of instances per sample unit		
Bones	1		1
	2		3
	3		8
	4		15
	5		23
	6		30
	7		40

(4) *Blemish.* "Blemish" means a piece of skin, a fin, a blood spot, a bruise, an excessively dark fat layer, curd spot, scales, or extraneous material. One "instance of skin" means one or more pieces of skin covering an accumulative area up to 1 square inch; except that individual skin pieces less than ⅛ square inch in area are not considered. One "instance of fin" means one identifiable fin or parts of any fin covering an aggregate area up to ½ square inch; except that any fin over ½ square inch in area is considered as 2 instances. One "instance of curd" means one curd spot or a group of curd spots covering an aggregate area up to one square inch; except that no individual curd spot less than 1/16 square inch in area is considered. One "instance of scales" means one scale or group of scales covering an aggregate area up to ½ square inch. One "blood spot", "bruise", or "excessively dark fat layer" (which is yellow, rusting, or extremely dark for the species of fish used) means a blood spot, bruise, or excessively dark fat layer which measures at least ⅛ square inch in area and which is objectionable.

(5) *Bones.* One "instance of bones" means one bone or part of any bone or one group of bones occupying or contacting a circular area up to 1 square inch.

(b) For the purpose of rating the factor of "absence of defects", the schedule of deduction-points in Table III apply.

§ 176.17 Character.

(a) The factor of character refers to the ease of separation of the portions, and the texture of the fish flesh and of the coating.

(1) *Ease of separation.* "Ease of separation" refers to the difficulty of separating one frozen portion from the other.

(2) *Texture.* "Texture" refers to the firmness, tenderness, and moistness of the cooked fish flesh, and to the crispness and tenderness of the coating of the cooked product. The texture of the cooked fish flesh may be classified as a degree of mushiness, tenderness, toughness, or fibrousness. The texture of the coating in the cooked state may be classified as a degree of pastiness, toughness, dryness, or mushiness.

(b) For the purpose of rating the factor of character, the schedule of deduction-points in Table IV apply. Frozen raw breaded fish portions which receive 15 deduction points for the factor of character shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

TABLE IV—SCHEDULE OF POINT-DEDUCTIONS FOR VARIATIONS IN CHARACTER

Character subfactors	Method of determining subfactor score	Number of portions affected	Deduction points
	Degree of ease of separation		
Ease of separation.	(a) Slight—Portions separated by hand with slight effort.	1 to 10	0
	(b) Moderate—Portions separated by hand with difficulty.	1 or 2	1
		3 or 4	2
		5 or 6	3
		7 to 10	5
	(c) Severe—Portions separated only by use of knife or other instrument.	1 or 2	2
		3 or 4	4
		5 or 6	6
		7 to 10	10
	Texture of coating is—		
Texture	(a) Firm or crisp, but not tough, pasty, or mushy.		0
	(b) Slightly tough, pasty, or mushy.		1
	(c) Moderately tough, pasty, or mushy.		5
	(d) Excessively tough, pasty, or mushy.		10
	Texture of fish flesh is—		
	(a) Firm, slightly resilient but not tough or rubbery; moist but not mushy.		0
	(b) Moderately firm, only slightly tough or rubbery; does not form a fibrous mass in the mouth; moist but not mushy.		1
	(c) Moderately tough or rubbery; has noticeable tendency to form a fibrous mass in the mouth; or is dry; or is mushy.		5
	(d) Excessively tough or rubbery; has marked tendency to form a fibrous mass in the mouth; or is very dry; or is very mushy.		15

TABLE V—MINIMUM FISH FLESH CONTENT ESTABLISHED FOR FROZEN RAW BREADED FISH PORTIONS

Surface area of portions (square inches)		Minimum fish flesh content
Over—	Up to—	
		Percent by weight
0	15	72
15	21	73
21		73

DEFINITIONS AND METHODS OF ANALYSIS

§ 176.21 Definitions and methods of analysis.

(a) *Minimum fish flesh content.* "Minimum fish flesh content" refers to the minimum percent, by weight, of fish flesh allowed for portions of various surface areas as specified in Table V.

The minimum fish flesh content for frozen raw breaded fish portions is determined by the following method:

(1) *Equipment and material.* (i) Water bath (3 to 4 liter beaker).

(ii) Balance accurate to 0.1 gram.

(iii) Clip tongs of wire, plastic, or glass.

(iv) Stop-watch or regular watch with second hand.

(v) Paper towels.

(vi) Spatula, 4-inch blade with rounded tip.

(vii) Nut picker.

(viii) Thermometer (immersion type) accurate to ±2°F.

(ix) Copper sulfate crystals (500 grams).

(2) *Procedure.* (i) Obtain the weight of each portion in the sample while it is still in a hard frozen condition.

(ii) Place each portion individually in the water bath maintained at 63° to 86° F. and allow to remain until such

NOTE: Several dry runs are necessary to determine the exact dip time required for "debreading" the portions in a lot sample. For dry runs only, a saturated solution of copper sulfate (500 grams of $CuSO_4.5H_2O$ in 2 liters of tap water) is necessary. The correct dip time is the minimum time required to dip the portions in the (copper sulfate) solution so that the breading can easily be scraped off; provided that (1) the "debreaded" portion is still solidly frozen, and (2) only a slight trace of blue color is visible on the surface of the "debreaded" fish portion.

time as the breading becomes soft and can easily be removed from the still frozen fish flesh (between 10 to 80 seconds for portions held in storage at 0° F.).

(iii) Remove the portion from the bath; blot lightly with double thickness paper toweling; and scrape off or pick out coating from the fish flesh with the spatula or nut picker.

(iv) Weigh the "debreaded" fish flesh of the portion.

(v) Calculate the percent of fish flesh in the sample by the following formula:

$$\text{Percent fish flesh} = \frac{\text{Weight of fish flesh (iv)}}{\text{Weight of raw breaded fish portion (i)}} \times (100)$$

(b) *Loose breading and frost.* "Loose breading and frost" refers to the percent, by weight, of "loose crumbs and frost" found in the sample package(s). "Loose breading and frost" is determined by use of a balance (accurate to 0.1 gram) in accordance with the following method:

(1) *Procedure.* (i) Remove the overwrap.

(ii) Weigh carton(s) and all contents.

(iii) Remove breaded fish portions.

(iv) Weigh carton(s) less breaded portions, but including crumbs, frost, and separators (if used).

(v) Remove crumbs and frost from the package(s).

(vi) Weigh cleaned carton(s) and separators.

(vii) Calculate percent loose breading and frost:

Label: .....
Size and kind of container: .....
Container mark or identification: .....
Size of lot: .....
Number of packages per master carton: .....
Size of sample: .....
Type of overwrap (if any): .....
Actual net weight: ..... (lb.) ..... (kg.)

Factor	Maximum score points	Deduction points
Appearance	25	
Uniformity	20	
Absence of defects	40	
Character	15	
Total	100	
Flavor and odor		
Final grade		

$$\text{Percent loose breading and frost} = \frac{\left(\begin{array}{c}\text{Weight carton(s) less breaded portions, but} \\ \text{including crumbs, frost, and separators (iv)}\end{array}\right) - \left(\begin{array}{c}\text{Weight cleaned carton(s)} \\ \text{and separators (vi)}\end{array}\right)}{\text{Weight of cartons(s) and all contents (ii)} - \left(\begin{array}{c}\text{Weight cleaned carton(s)} \\ \text{and separators (vi)}\end{array}\right)} \times 100$$

(c) *Cooking in a suitable manner.* "Cooking in a suitable manner" means cooking in accordance with the frying instructions accompanying the product. However, if specific instructions for frying are lacking, the product for inspection is cooked as follows:

(1) *Equipment and material.* (i) Deep fat fryer (thermostatically controlled).

(ii) Wire mesh deep fry basket.

(iii) Sufficient fat to cover portions.

(iv) Paper towels.

(2) *Procedure.* (i) While still in the frozen state, place the sample to be cooked in a wire-mesh deep-fry basket sufficiently large to hold the portions in a single layer without touching each other.

(ii) Lower basket and its contents into suitable liquid oil or hydrogenated oil heated to 350–375 degrees Fahrenheit. Maintain these temperatures throughout the cooking operation. Fry for three to five minutes, or until the portions attain a pleasing golden brown color.

(iii) Remove basket from oil and allow to drain for fifteen seconds. Place the cooked portions on a paper napkin or towel to absorb excess oil.

PART 177—UNITED STATES STANDARDS FOR GRADES OF FROZEN COD FILLETS [1]

On page 9399 of the FEDERAL REGISTER of November 21, 1959, there was published a notice and text of a proposed new part 177 of Title 50, Code of Federal Regulations. The purpose of the new part is to issue United States Standards for Grades of Frozen Cod Fillets under the authority transferred to the Department of the Interior by section 6(a) of the Fish and Wildlife Act of August 8, 1956 (16 U.S.C. 742e).

Interested persons were given until December 18, 1959, to submit written comments, suggestions or objections with respect to the proposed new part. No comments, suggestions or objections have been received, and the proposed new part is hereby adopted without change and is set forth below. This amendment shall become effective at the beginning of the 30th calendar day following the date of this publication in the FEDERAL REGISTER.

Dated: February 23, 1960.

ELMER F. BENNETT,
Acting Secretary of the Interior.

[1] Compliance with the provisions of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

LOT CERTIFICATION TOLERANCES

§ 176.25 Tolerances for certification of officially drawn samples.

The sample rate and grades of specific lots shall be certified in accordance with Part 170, of this chapter (Regulations Governing Processed Fishery Products, 23 F.R. 5064, July 3, 1958).

SCORE SHEET

§ 176.31 Score sheet for frozen raw breaded fish portions.

PRODUCT DESCRIPTION AND GRADES

Sec.
177.1 Product description.
177.2 Grades of frozen cod fillets.

WEIGHTS AND DIMENSIONS

177.6 Recommended weights and dimensions.

FACTORS OF QUALITY

177.11 Ascertaining the grade.
177.12 Evaluation of the unscored factor of flavor and odor.
177.13 Evaluation and rating of the scored factors: Appearance, size, absence of defects, and character.
177.14 Appearance.
177.15 Size.
177.16 Absence of defects.
177.17 Character.

DEFINITIONS AND METHODS OF ANALYSIS

177.21 Definitions and methods of analysis.

LOT CERTIFICATION TOLERANCES

177.25 Tolerances for certification of officially drawn samples.

SCORE SHEET

177.31 Score sheet for frozen cod fillets.

AUTHORITY: §§ 177.1 to 177.31 issued under sec. 6(a), Fish and Wildlife Act of August 8, 1956; 16 U.S.C. 742e.

PRODUCT DESCRIPTION AND GRADES

§ 177.1 Product description.

The product described in this part consists of clean, whole, wholesome fillets or primarily large pieces of clean, whole, wholesome fillets, cut away from either side of cod, Gadus morhua or Gadus macrocephalus; the fillets may be either skinless or with skin on. They are packaged and frozen in accordance with good commercial practice and are maintained at temperatures necessary for the preservation of the product. (This part does not provide for the grading of pieces of fish flesh cut away from previously frozen fish blocks, slabs, or similar products.)

§ 177.2 Grades of frozen cod fillets.

(a) "U.S. Grade A" is the quality of frozen cod fillets that possess good flavor and odor; and for those factors of quality which are rated in accordance with the scoring system outlined in this part the total score is not less than 85 points.

(b) "U.S. Grade B" is the quality of frozen cod fillets that possess at least reasonably good flavor and odor; and for those factors of quality which are rated in accordance with the scoring system outlined in this part the total score is not less than 70 points.

(c) "Substandard" is the quality of frozen cod fillets that fail to meet the requirements of U.S. Grade B.

WEIGHTS AND DIMENSIONS

§ 177.6 Recommended weights and dimensions.

(a) The recommendations as to net weights and dimensions of packaged frozen cod fillets are not incorporated in the grades of the finished product since net weights and dimensions, as such, are not factors of quality for the purpose of these grades.

(b) It is recommended that the net weights of the packaged frozen cod fillets be not less than 12 ounces and not over 10 pounds.

FACTORS OF QUALITY

§ 177.11 Ascertaining the grade.

The grade of frozen cod fillets is ascertained by examining the product in the frozen, thawed, and cooked states. The following factors of quality are evaluated in ascertaining the grade of the product: Flavor and odor, appearance, size, absence of defects, and character. These factors are rated in the following manner:

(1) *Flavor and odor.* This factor is rated directly by organoleptic evaluation. Score points are not assessed (see § 177.12).

(2) *Appearance, size, absence of defects, and character.* The relative importance of these factors is expressed numerically on the scale of 100. The maximum number of points that may be given each of these factors are:

Factors	*Points*
Appearance	25
Size	20
Absence of defects	40
Character	15
Total possible score	100

§ 177.12 Evaluation of the unscored factor of flavor and odor.

(a) *Good flavor and odor.* "Good flavor and odor" (essential requirement for a Grade A product) means that the fish flesh has good flavor and odor characteristic of cod (Gadus morhua or Gadus macrocephalus) and is free from staleness, and off-flavors and off-odors of any kind.

(b) *Reasonably good flavor and odor.* "Reasonably good flavor and odor" (minimum requirement of a Grade B product) means that the fish flesh may be somewhat lacking in good flavor and odor; and is free from objectionable off-flavors and off-odors of any kind.

§ 177.13 Evaluation and rating of the scored factors; appearance, size, absence of defects, and character.

The essential variations in quality within each factor which is scored are so described that the value may be ascertained for each factor and expressed numerically. Point deductions are allotted for each degree or amount of variation within each factor. The net score for each factor is the maximum points for that factor less the sum of the deduction-points within the factor. The total score for the product is the sum of the net scores for the four scored factors.

§ 177.14 Appearance.

(a) The factor of appearance refers to the normal color of the species of frozen fish flesh, and to the degree and amount of surface dehydration of the frozen product.

(b) For the purpose of rating the factor of appearance the schedule of deduction-points in Tables I and II apply. Frozen cod fillets which receive 25 deduction points for the factor of appearance shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

TABLE I—SCORE DEDUCTIONS FOR DISCOLORATION

Color of frozen product	Deduction points	
	"Light" colored portion comprising main portion of fillet	"Dark" colored portion occurring under skin mainly along lateral line
No discoloration	0	0
Slight yellowing	2	1
Moderate yellowing	4	2
Excessive yellowing and/or any rusting	13	12

TABLE II—SCORE DEDUCTIONS FOR DEHYDRATION

Degree of dehydration of frozen product	Surface area affected (percent)		Deduction points
	Over—	Not over—	
Slight—Shallow and not color masking	0	1	0
	1	50	2
	50	100	5
Moderate—Deep but just deep enough to easily scrape off with fingernail	1	25	5
	25	50	8
	50	100	16
Excessive—Deep dehydration not easily scraped off	1	25	12
	25	100	25

§ 177.15 Size.

(a) The factor of size refers to the degree of freedom from undesirably small fillet pieces. Any fillet piece weighing less than 2 ounces is classed as being undesirably small.

(b) For the purpose of rating the factor of size the schedule of deduction-points in Table III apply. Cod fillets which receive 20 deduction points for this factor shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

TABLE III—SCORE DEDUCTIONS FOR SIZE OF FILLET PIECES

Number of fillet pieces less than 2 ounces per pound		Deduction points
Over—	Not over—	
0	0	0
	1	1
1	2	10
2	3	15
3	4	20

§ 177.16 Absence of defects.

(a) The factor of "absence of defects" refers to the degree of freedom from improper packing, cutting and trimming imperfections, blemishes, and bones. Evaluation for the defect of improper packing is made on the frozen product. Evaluation of the defects of cutting and trimming, blemishes, and bones are made on the thawed product.

(1) *Improper packing.* "Improper packing" means poor arrangement of fillets, presence of voids, depressions, frost, and the imbedding of packaging material into the frozen fish flesh.

(2) *Cutting and trimming imperfections.* "Cutting and trimming imperfections" means that the thawed fillets have ragged edges, tears, holes, or are otherwise improperly cut or trimmed.

(3) *Blemish.* "Blemish" means an instance of skin (except for skin-on fillets), scales, blood-spot, bruise, black-belly lining, fin, or extraneous material. One "instance of skin" consists of one piece of skin not less than ½ square inch and not more than 1½ square inches in area; each additional ½ square inch area of individual skin pieces greater than 1½ square inches is considered as an additional instance. One "instance of blood spot" is one of such size and prominence as to be considered objectionable. One "instance of black-belly lining" is any piece of black-belly lining not less than ½ inch and not more than 1 inch in length; each additional ½ inch length of individual pieces of black-belly lining longer than 1 inch is considered as an instance. Each aggregate area of identifiable fin or parts of any fin up to 1 square inch is considered as one "instance of fin". Each aggregate area up to 1 square inch per fillet of one scale or group of scales is considered as one "instance of scales". An "instance of bruise" consists of a bruise not less than ½ square inch and not more than 1½ square inches in area; each bruise larger than 1½ square inches is considered as two instances of bruise.

(4) *Bones.* One "instance of bone" means one bone or one group of bones occupying or contacting a circular area up to 1 square inch.

(b) For the purpose of rating the factor of "absence of defects" the schedule of deduction-points in Table IV apply.

TABLE IV—SCORE DEDUCTIONS FOR ABSENCE OF DEFECTS

Defects subfactors	Method of determining subfactor score	Deduction points
Improper packing.	Moderate defects, noticeably affecting the product's appearance.	2
	Excessive defects, seriously affecting product's appearance.	4
Blemishes	Number of blemishes per 1 lb. of fish flesh:	
	Over 0 not over 1	1
	Over 1 not over 2	3
	Over 2 not over 3	5
	Over 3 not over 4	8
	Over 4 not over 5	12
	Over 5 not over 6	16
	Over 6 not over 7	30
	Over 7	40
Bones	Number of instances per 1 lb. of fish flesh:	
	Over 0 not over 1	0
	Over 1 not over 2	2
	Over 2 not over 3	4
	Over 3 not over 4	6
	Over 4 not over 5	8
	Over 5 not over 6	14
	Over 6 not over 7	20
	Over 7	40
Cutting and trimming.	Slight defects, scarcely noticeable.	0
	Moderate defects, noticeable but not affecting the useability of any fillets.	4
	Excessive defects impairing:	
	(a) the useability of up to ¼ of the total number of fillets.	8
	(b) the useability of over ¼ but not more than ½ of the total number of fillets.	16
	(c) the useability of over ½ of the total number of fillets.	40

§ 177.17 Character.

(a) The factor of character refers to the amount of free drip in the thawed fillets, and to the tenderness and moistness of the cooked fish flesh.

(b) For the purpose of rating the factor of character, the schedule of deduction-points in Table V apply. Cod fillets which receive 15 deduction-points

for the factor of character shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

TABLE V—SCORE DEDUCTIONS FOR CHARACTER

Character subfactors	Method of determining subfactor score	Deduction points
Texture	Texture of the cooked fish:	
	(a) Firm, slightly resilient but not tough or rubbery; moist but not mushy.	0
	(b) Moderately firm; only slightly tough or rubbery; does not form a fibrous mass in the mouth; moist but not mushy.	4
	(c) Moderately tough or rubbery; has noticeable tendency to form a fibrous mass in the mouth; or is dry; or is mushy.	8
	(d) Excessively tough or rubbery; has marked tendency to form a fibrous mass in the mouth; or is very dry; or is very mushy.	15
Drip	Percent of drip:	
	Over 0 not over 5	0
	Over 5 not over 6	1
	Over 6 not over 8	2
	Over 8 not over 10	4
	Over 10 not over 12	6
	Over 12 not over 14	9
	Over 14 not over 16	12
	Over 16	15

DEFINITIONS AND METHODS OF ANALYSIS

§ 177.21 Definitions and methods of analysis.

(a) *Percent of drip.* "Percent of drip" means the percent by weight of "free drip" (the fluid which is not reabsorbed by the fish tissue when the frozen fish thaws, and which separates freely without the aid of any external forces except gravity) in an individual package as determined by the following method:

(1) *Apparatus and materials.* (i) Water bath.

(ii) Balance, accurate to 0.1 gm; or 0.01 ounce.

(iii) Pliable and impermeable bag (cryovac, pliofilm, etc.).

(iv) Corrosion resistant metal rod weight (preferably stainless steel or monel metal), measuring 3½ inches in length and approximately ¼–½ inch in diameter.

(v) U.S. Standard No. 8 mesh circular sieve (both 8 and 12 inch diameters).

(vi) Stirring motor.

(vii) Identification tags.

(2) *Procedure.* (i) Place metal rod weight into an empty pliable bag.

(ii) Weigh the bag and the metal weight.

(iii) Remove the frozen fish material from the container (container consists of the carton and the inner and outer wrapping).

(iv) Place the frozen product, plus scraps of any material remaining in the container, into the pliable bag.

(v) Weigh the bag and its contents and subtract tare (empty bag and metal weight) to determine the net weight of the product.

(vi) Suspend the bag and contents in an agitated water bath maintained at 68° F. plus or minus 2° F. The bag should be suspended in the water so that the fish flesh is below the water line.

(vii) Allow the bag and its contents to remain immersed until the product is defrosted (a "test run", in advance, is necessary to determine time required for each product and quantity of product).[1]

(viii) Remove bag and contents from bath and gently dry outside of bag.

(ix) Weigh dry U.S. Standard No. 8 mesh circular sieve.

(x) Open bag and empty contents onto U.S. Standard No. 8 circular sieve so as to distribute the product evenly, inclining the sieve slightly to facilitate drainage, and allowing to drain for two minutes.

(xi) Weigh sieve and its contents and calculate drained weight. The drained weight is the weight of sieve and fillets less the weight of the dry sieve.

(xii) Calculate percent drip:

$$\frac{\text{Net weight (v)} - \text{drained weight (xi)} \times (100)}{\text{Net weight (v)}} = \text{Percent of drip.}$$

(b) *Cooking in a suitable manner.* "Cooking in a suitable manner" shall mean that the product is cooked as follows: Place the thawed unseasoned product into a boilable film-type pouch; fold the open end of the pouch over the suspension bar and clamp in place to provide a loose seal. Immerse the pouch and its contents in boiling water and cook until the internal temperature of the fillets reaches 160° F. (about 20 minutes).

LOT CERTIFICATION TOLERANCES

§ 177.25 Tolerances for certification of officially drawn samples.

The sample rate and grades of specific lots shall be certified in accordance with Part 170 of this chapter (Regulations Governing Processed Fishery Products, 23 F.R. 5064, July 3, 1958).

§ 177.31 Score sheet for frozen cod fillets.

SCORE SHEET

Label: _____

Size and kind of container: _____

Container mark or identification: _____

Size of lot: _____

Number of packages per master carton: _____

Size of sample: _____

Type of overwrap: _____

Actual net weight: _____ (lb.) _____ (kg.)

Factor	*Score points*	*Sample score*
Appearance	25	
Size	20	
Absence of defects	40	
Character	15	
Total	100	
Flavor and Odor		
Final Grade		

[1] The purpose of the "test run" is to determine the time necessary to thaw the product. The complete thawing of the product is determined by frequent but gentle squeezing of the bag until no hard core or ice crystals are felt. This package which has been squeezed can not be used for drained weight calculations.

Note: Also see Commercial Fisheries Review, February 1960, p. 101; January 1960, p. 94.

* * * * * *

FROZEN SALMON STEAKS VOLUNTARY GRADE STANDARDS PROPOSED:

Frozen salmon steaks voluntary grade standards are proposed by the U. S. Bureau of Commercial Fisheries. The regulations are proposed for adoption in accordance with the authority contained in Title II of the Agricultural Marketing Act of August 14, 1946, as amended. Functions under that Act pertaining to fish, shellfish, and any products thereof were transferred to the Department of the Interior by section 6(a) of the Fish and Wildlife Act of August 8, 1956.

The proposed standards, if recommended to the Secretary of the Interior for adoption and made effective, will be the first issued by the Department prescribing voluntary grade standards for frozen salmon steaks.

The proposed standards include product description, styles and grades, factors of quality and grade, including ascertaining the grade; definitions; lot certification tolerances; and score sheets.

The frozen salmon steaks are described as clean, wholesome units of frozen raw fish meat with normally associated skin and bone and are 2.5 ozs. or more in weight. Each steak has two parallel surfaces and is derived from whole or subdivided salmon slices of uniform thickness which result from sawing or cutting dressed salmon perpendicularly to the axial length, or backbone. Steaks are prepared from either frozen or unfrozen salmon (Oncorhynchus sp.) and are processed, frozen, and packaged. The species of salmon covered are silver or coho; chum or keta; king, chinook or spring; red or sockeye; and pink.

Tariff Commission

SHRIMP INVESTIGATION ANNOUNCED: In response to a resolution of the Committee on Ways and Means of the House of Representatives, adopted February 9, 1960, the U. S. Tariff Commission has instituted an investigation with regard to shrimp under the authority of section 332 of the Tariff Act of 1930 (19 U.S.C. 1332).

The resolution directs the Commission, pursuant to section 332 of the Tariff Act of 1930, "to make an investigation to determine whether shrimp, as a result of the existing customs treatment thereof as provided for by paragraph 1761 of such Act, are being imported into the United States in such increased quantities, either actual or relative to domestic production, as to cause or threaten serious injury to the domestic shrimp industry, and to report the results of such investigation to the Committee on Ways and Means of the House of Representatives not later than three months after the date of the adoption of this resolution. If such determination is in the affirmative the Commission shall specify in its report the rate or rates of duty (not in excess of 50 per centum ad valorem) which it determines to be necessary to remedy or prevent such serious injury. In the course of its investigation the Commission shall hold a hearing at which interested parties shall be given reasonable opportunity to be present and be heard; and in making its determinations under this resolution the Commission shall take into consideration the factors set forth in section 7(b) of the Trade Agreements Extension Act of 1951."

A public hearing was held on March 16, 1960, in Washington, D. C.

Eighty-Sixth Congress

(Second Session)

Public bills and resolutions which may directly or indirectly affect fisheries and allied industries are reported. Introduction, referral to Committees,

pertinent legislative actions, hearings, and other actions by the House and Senate, as well as signature into law or other final disposition are covered.

ALASKA FISHERIES REHABILITATION: The Alaska State Legislature submitted its House Joint Memorial 33 to the United States Senate on February 23, 1960. The memorial urged that the State of Alaska be provided funds by Congress in the amount of $30 million over a period of 15 years to rehabilitate the fisheries of the State of Alaska through a program embracing research, development, conservation, and processing aspects of fishing.

COLOR ADDITIVES IN FOOD: The House Committee on Interstate and Foreign Commerce heard testimony on March 11, 1960, of representatives of the Department of Agriculture with respect to color additives legislation (H. R. 7624 and S. 2197).

FISHERIES ASSISTANCE ACT: In a joint committee meeting, conferees in executive session agreed to file a conference report on the differences between the Senate- and House-passed versions of H. R. 5421 (MacDonald), to provide a program of assistance in the construction of fishing vessels. On March 1, 1960, the Senate and House conferees agreed to the bill, in principle, but a compromise on the amount of money involved was made. The House bill provided $1,000,000 per annum while the Senate bill provided $5,000,000 per annum. A compromise was reached on a figure of $2,500,000 per annum for three years. The House provision limiting assistance to those fisheries denied relief under "escape clause" action was modified somewhat, making certain vessel owners eligible for assistance where no duties are involved and therefore not subject to the jurisdiction of the Tariff Commission.

FISHERY LEGISLATION: Fishery and Wildlife Legislation (Hearings, August 4, 5, and 6, 1959, before the Merchant Marine and Fisheries Subcommittee of the Committee on Interstate and Foreign Commerce, United States Senate, 86th Congress, 1st Session, on S. 1262, S. 1374, S. 1391, S. 1575, S. 1576, S. 1781, S. 2053, S. 2338, S. 2342, S. 2481, S. 2578, H. R. 5854, and H. R. 2398, bills pertaining to fishery and wildlife legislation), 280 pp., printed. Contains texts of the several legislative bills; testimony presented by Government and private industry representatives; and various reports and statements submitted for the record. Hearings on S. 2338 (a bill to

provide a program to correct inequities in the construction of fishing vessels and to enable the fishing industry of the United States to regain a favorable and competitive status, and for other purposes) include portions of the tuna fish industry hearings held in Los Angeles, Calif., before Senator Engle on June 1, 1959; testimony of several representatives of the United States tuna industry; and testimony of the Director of the Bureau of Commercial Fisheries concerning problems of the tuna industry in southern California.

FISHERY EXTENSION SERVICE: H. R. 10846 (Coffin of Maine) and H. R. 10864 (Oliver of Maine). Identical bills to authorize the Secretary of the Interior to establish a fishery extension service in the Fish and Wildlife Service of the Department of the Interior for the purposes of carrying out cooperative fishery extension work with the States, territories, and possessions; to the Committee on Merchant Marine and Fisheries; introduced in House March 2, 1960.

HAWAII OMNIBUS ACT: S. 3054 (Murray et al), a bill to amend certain laws of the United States in light of the admission of the State of Hawaii into the Union, and for other purposes; to the Committee on Interior and Insular Affairs; introduced in Senate February 17, 1960. The bill is designated to make changes in Federal laws which have become necessary and desirable because of the change in Hawaii's status from Territory to a State. Section 13 of the bill contains perfecting amendments to the statute which authorizes the Secretary of Interior to undertake exploration, investigation, development, and maintenance projects for fishery resources in the Pacific, by deleting inappropriate references to "Territory" and "Hawaiian Islands."

HYDROFOIL VESSEL: S. 3126 (Bartlett), a bill to authorize the construction of an ocean-going hydrofoil vessel in order to demonstrate the commercial application of hydrofoil seacraft; to the committee on Interstate and Foreign Commerce; introduced in Senate March 1, 1960.

INTERIOR APPROPRIATIONS: The House on February 16, 1960, passed by a voice vote H. R. 10401 (Kirwan), a bill making appropriations for the Department of Interior and related agencies for fiscal year 1961, and for other purposes. Included in the bill is an increase of $4,090,800 for the Fish and Wildlife Service, primarily to replace permanent appropriations from receipts, including duck stamp funds, which will no longer be available for operations, enforcement, or research.

Senator Kuchel on the floor of the Senate on March 2, 1960, made a statement urging the incorporation in the 1961 Interior appropriation bill of $400,000 for studies of oceanography and biology of tunas. The appropriation bill is in the Senate Appropriations Committee.

LAW OF THE SEA: The State of Alaska Senate in its Senate Memorial 9 submitted to the United States Senate on February 22, 1960, urged that the Senate of the United States advise and consent to ratification of four conventions and a protocol formulated at the United Nations Conference on Law of the Sea, held at Geneva February 24 to April 27, 1958. In the case of the Convention on Fishing and Conservation of the Living Resources of the High Seas, ratification was urged to the proposed understanding as regards the conservation procedure known as "abstention."

OCEANOGRAPHIC SURVEYS: H. R. 10546 (Oliver), a bill to establish a public policy with respect to oceanographic surveys, and to provide for coordination of the efforts of Federal agencies with respect to oceanographic surveys; to the Committee on Merchant Marine and Fisheries; introduced in House February 18, 1960. Identical to H. R. 10412 (G. P. Miller), introduced February 15, 1960; and H. R. 10581 (Pelly), introduced in House February 22, 1960.

Representative Oliver, a member of the special Subcommittee on Oceanography of the House Merchant Marine and Fisheries Committee, introduced into the Congressional Record of February 18, 1960, his recommendations in favor of H. R. 10412 (G. P. Miller) and his own bill, H. R. 10546. His report discusses the need for more oceanographic research, especially in view of Russian advances in that field. The article covers Soviet oceanic expansion, fishing in distant waters, and interest in world oceans. Representative Oliver recommends an increase of $18 million in the 1961 fiscal year budget over the $37.7 million fiscal year 1960 appropriations for all oceanographic activities by the Federal Government.

PUBLIC HEALTH SERVICE CARE FOR FISHING VESSEL OWNERS: H. R. 9926 (Mr. Clem Miller), a bill to amend section 322 of the Public Health Service Act to permit certain owners of fishing vessels to receive medical care and hospitalization without charge at hospitals of the Public Health Service; referred to the Committee on Interstate and Foreign Commerce; introduced in House January 26, 1960. The amendment would provide Public Health Service care to persons who own vessels registered, enrolled, or licensed under the maritime laws of the United States, who are engaged in commercial fishing operations, and who accompany such vessels on such fishing operations and a substantial part of whose services in connection with such fishing operations are comparable to services performed by seamen employed on such vessels or on vessels engaged in similar operations.

SALMON FISHING IN NORTH PACIFIC: On February 27, 1960, the Legislature of the State of Alaska, in its House Joint Memorial 32 to the United States Senate, urged that the Congress and the executive branch proceed with deliberate speed to provide for immediate stoppage of all salmon fishing by nets on the high seas of the North Pacific and Bering Sea.

SECOND SUPPLEMENTAL APPROPRIATIONS: H. R. 10743 (Thomas), a bill making supplemental appropriations for the fiscal year ending June 30, 1960, and for other purposes; introduced February 26, 1960 (H. Rept. 1292); to the Committee of the Whole House on the State of the Union. Includes for the Fish and Wildlife Service, Bureau of Commercial Fisheries, an increase of $55,000 to modify and improve docking facilities at the technological laboratory, Pascagoula, Miss.

Second Supplemental Appropriation Bill, 1960 (Hearings before the Subcommittee of the Committee on Appropriations, House of Representatives, 86th Congress, 2nd Session) 395 pp., printed. In-

cludes statement of purpose and need for supplemental funds of $55,000 for the Bureau of Commercial Fisheries to modify and improve docking facilities of the technological laboratory, Pascagoula, Miss.

SHRIMP IMPORT DUTIES: H. R. 10608 (Rivers of Alaska), a bill to amend the Tariff Act of 1930 to provide for the establishment of country-by-country quotas for the importation of shrimp and shrimp products, to impose a duty on all unprocessed shrimp imported in excess of the applicable quota, and to impose duty on processed shrimp and prohibit its importation in excess of the applicable quota; to the Committee on Ways and Means; introduced in House February 23, 1960. Identical to several bills introduced during the first session of the 86th Congress.

Similar to H. R. 10961 (Herlong), a bill to amend the Tariff Act of 1930 to provide for the establishment of country-by-country quotas for the importation of shrimp and shrimp products, to impose a duty on all shrimp imported in excess of the applicable quota; to the Committee on Ways and Means; introduced in House March 8, 1960. Similar in purpose to about 29 bills introduced during the first and second sessions of the 86th Congress. H. R. 10961 omits part of the language of H. R. 8769 (Herlong) which was introduced on August 24, 1959, during the first session of the 86th Congress. The major change in this new version is that quantities up to the amount of the quota on both unprocessed and processed shrimp will enter duty free. Everything above quota, for both unprocessed and processed would be dutiable at 50 percent. The old bill would have allowed all unprocessed shrimp up to the quota to be duty-free; over quota, 50 percent. All processed shrimp up to the quota would have been dutiable at 25 percent, and none would have been allowed over quota.

TARIFF NEGOTIATIONS: H. Con. Res. 592 (Knox), concurrent resolution expressing the sense of Congress that the United States should not grant further tariff reductions in the forthcoming tariff negotiations under the provisions of the Trade Agreements Extension Act of 1958, and for other purposes; identical to H. Con. Res. 593 (Gray); both referred to the Committee on Ways and Means; introduced in House February 17, 1960. Also identical to H. Con. Res. 594 (Flynt), introduced February 22, 1960; H. Con. Res. 610 (Bray), introduced March 7, 1960; and 19 other concurrent resolutions previously reported.

TRANSPORTATION: S. 3048 (Magnuson), a bill to amend the Interstate Commerce Act with respect to reasonable differentials in favor of joint rates for through transportation by rail and water, and for other purposes; to the Committee on Interstate and Foreign Commerce; introduced in Senate February 16, 1960.

HERRING SPAWN DRIFT STUDIED

Studies by the U. S. Bureau of Commercial Fisheries of the non-tidal circulation in the Gulf of Maine-Georges Bank area and its effect upon the distribution and survival of larval herring are being made. Indications are that an intrusion of warm Slope and Gulf Stream water over the southern part of Georges Bank in the fall of the year occurs more frequently than previously expected. Drift bottle and transponding radio buoy studies indicate that the surface waters in the area of herring spawning on Georges Bank move in a southwesterly direction and that herring larvae in these surface waters would be carried off the southern edge of the bank into the slope water zone and lost to the fishery.

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* * * * *

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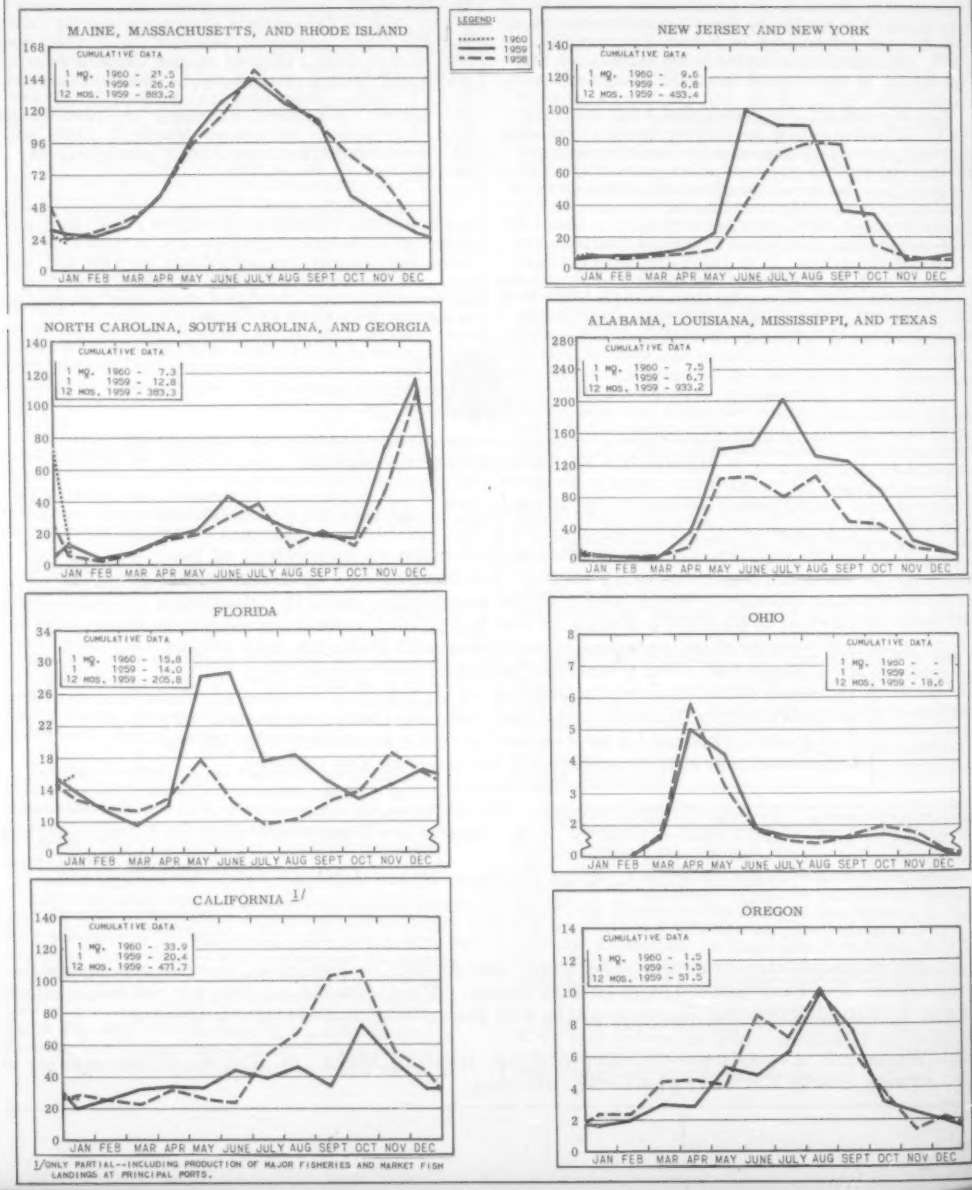
FISHERY INDICATORS

CHART I - FISHERY LANDINGS for SELECTED STATES

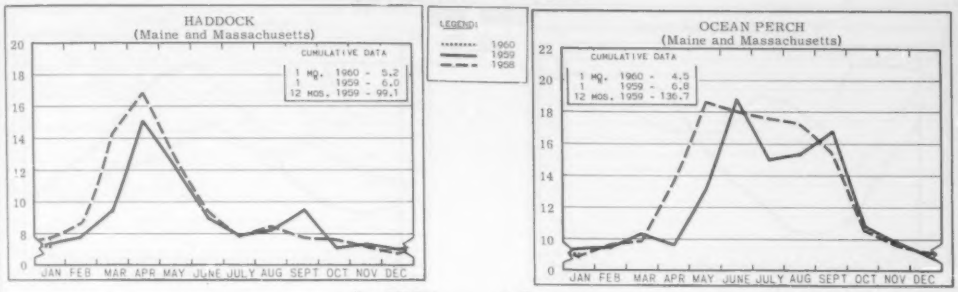
In Millions of Pounds



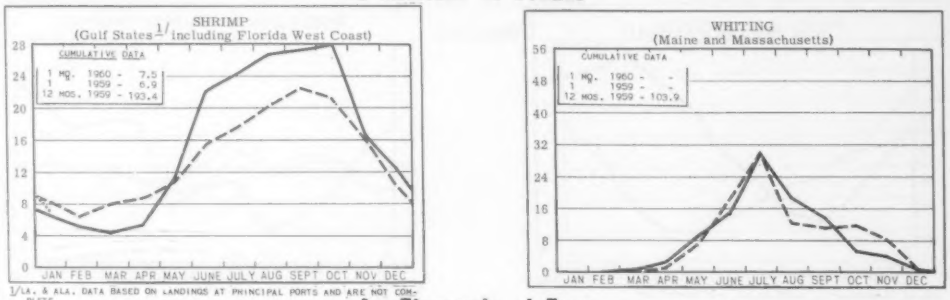
1/ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

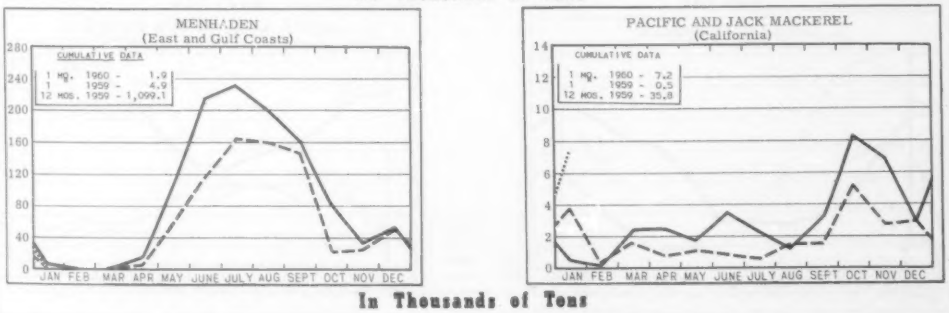


In Millions of Pounds


SHRIMP
(Gulf States 1/ including Florida West Coast)
CUMULATIVE DATA
1 MO. 1960 - 7.5
1 " 1959 - 6.9
12 MOS. 1959 - 193.4
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
WHITING
(Maine and Massachusetts)
CUMULATIVE DATA
1 MO. 1960 - -
1 " 1959 - -
12 MOS. 1959 - 103.9
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/LA., & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons


MENHADEN
(East and Gulf Coasts)
CUMULATIVE DATA
1 MO. 1960 - 1.9
1 " 1959 - 4.9
12 MOS. 1959 - 1,099.1
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
PACIFIC AND JACK MACKEREL
(California)
CUMULATIVE DATA
1 MO. 1960 - 7.2
1 " 1959 - 0.5
12 MOS. 1959 - 35.8
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

In Thousands of Tons

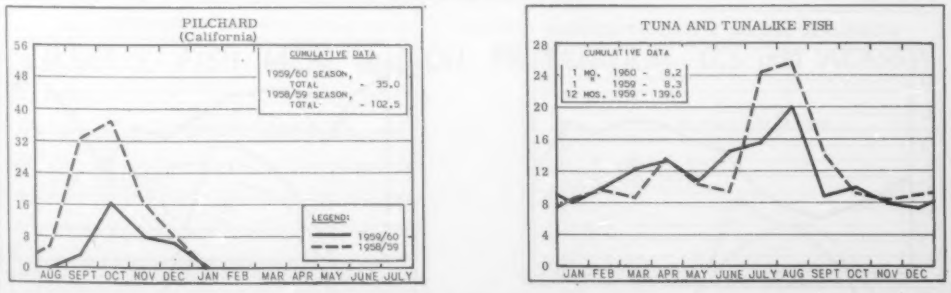
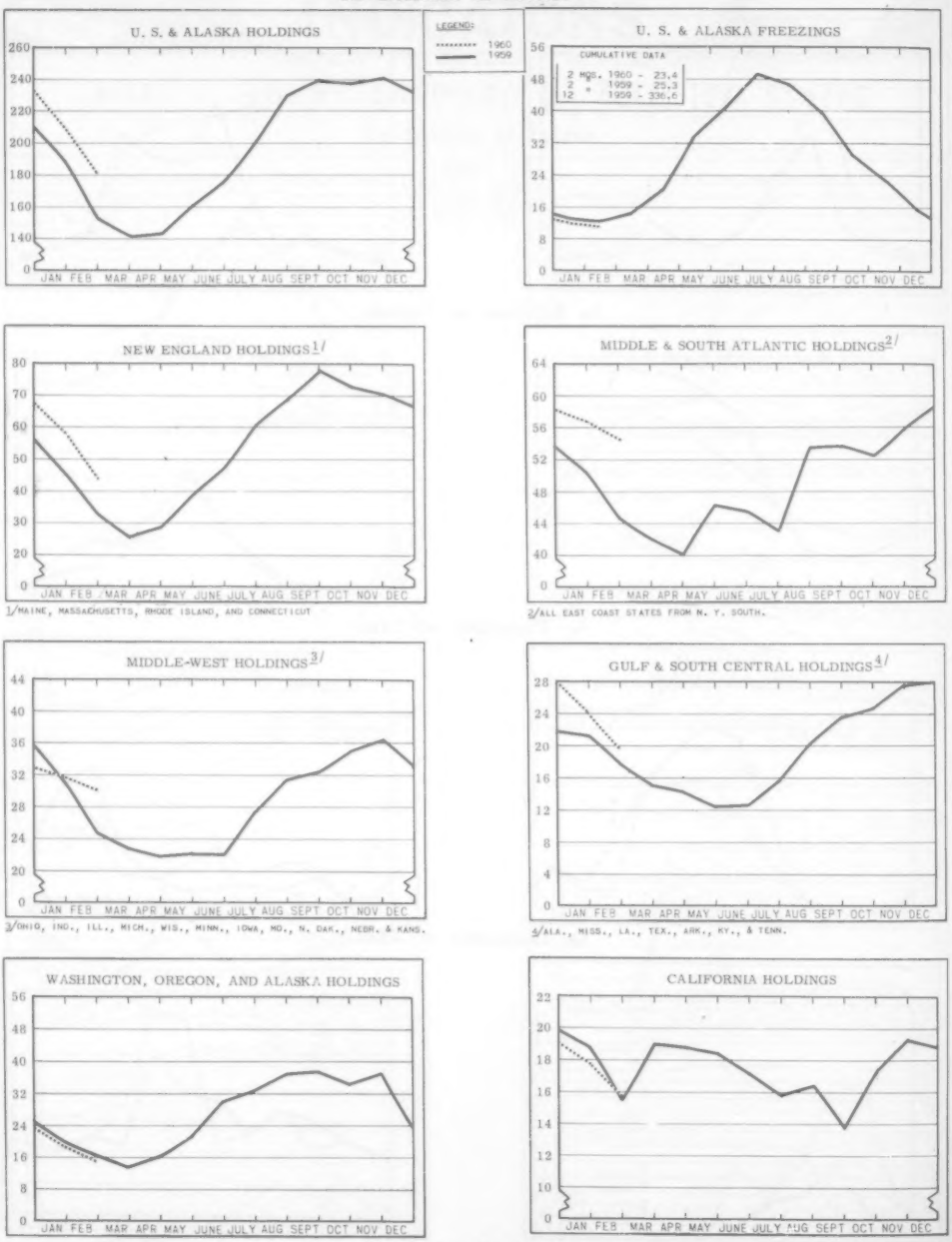

PILCHARD
(California)
CUMULATIVE DATA
1959/60 SEASON, TOTAL - 35.0
1958/59 SEASON, TOTAL - 102.5
LEGEND:
1959/60
1958/59
AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY JUNE JULY
TUNA AND TUNALIKE FISH
CUMULATIVE DATA
1 MO. 1960 - 8.2
1 " 1959 - 8.3
12 MOS. 1959 - 139.6
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

In Millions of Pounds


U. S. & ALASKA HOLDINGS
LEGEND:
1960
1959
U. S. & ALASKA FREEZINGS
CUMULATIVE DATA
2 MOS. 1960 - 23.4
2 " 1959 - 25.3
12 " 1959 - 336.6
NEW ENGLAND HOLDINGS 1/
MIDDLE & SOUTH ATLANTIC HOLDINGS 2/
MIDDLE-WEST HOLDINGS 3/
GULF & SOUTH CENTRAL HOLDINGS 4/
WASHINGTON, OREGON, AND ALASKA HOLDINGS
CALIFORNIA HOLDINGS
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT

2/ALL EAST COAST STATES FROM N. Y. SOUTH.

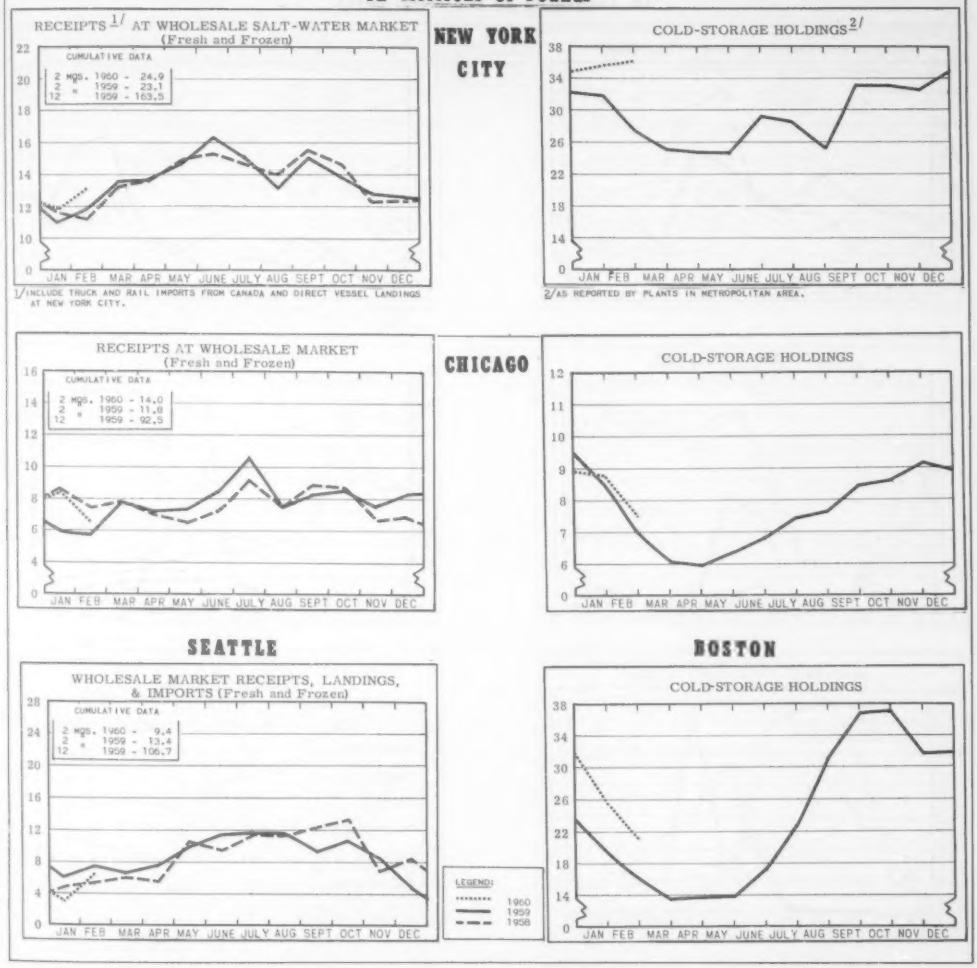
3/OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR. & KANS.

4/ALA., MISS., LA., TEX., ARK., KY., & TENN.

* Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds



1/ INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

2/ AS REPORTED BY PLANTS IN METROPOLITAN AREA.

CHART 5 - FISH MEAL and OIL PRODUCTION - U.S and ALASKA

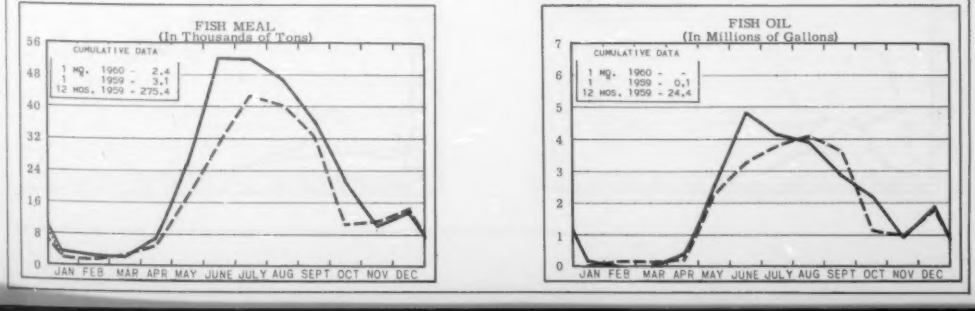
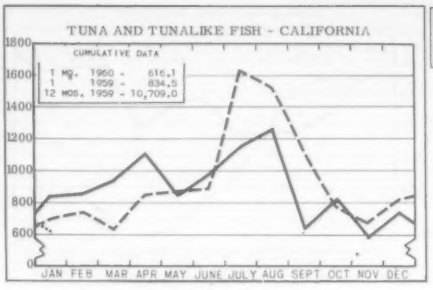
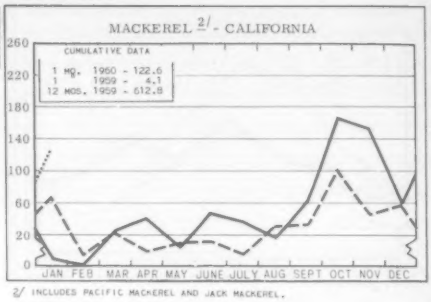

FISH MEAL
(In Thousands of Tons)
CUMULATIVE DATA
1 MO. 1960 - 2.4
1 " 1959 - 3.1
12 MOS. 1959 - 275.4
FISH OIL
(In Millions of Gallons)
CUMULATIVE DATA
1 MO. 1960 - -
1 " 1959 - 0.1
12 MOS. 1959 - 24.4
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

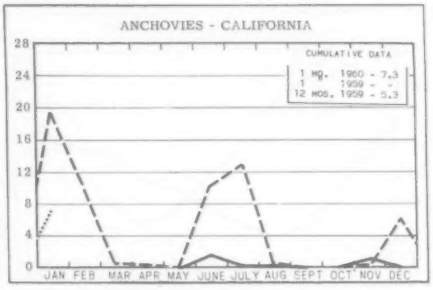
CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

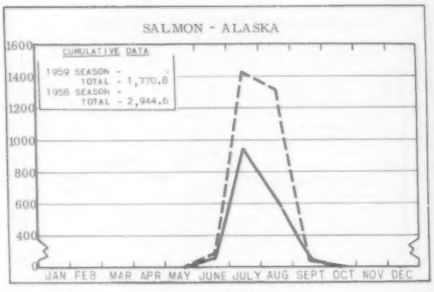
In Thousands of Standard Cases

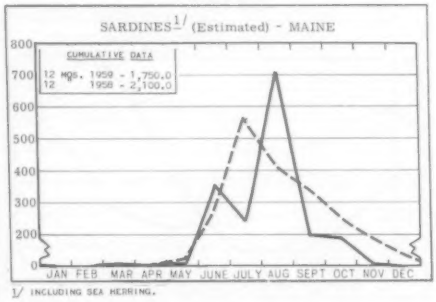




2/ INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



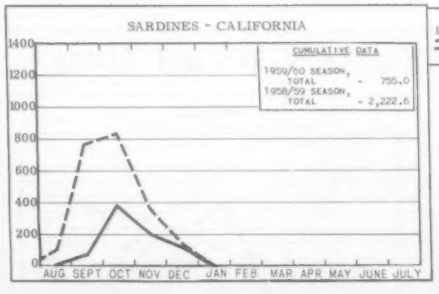




1/ INCLUDING SEA HERRING.

STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	¼ drawn	3¾ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# ½ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	½-lb.	8 oz.



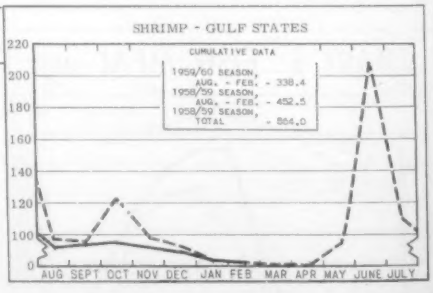
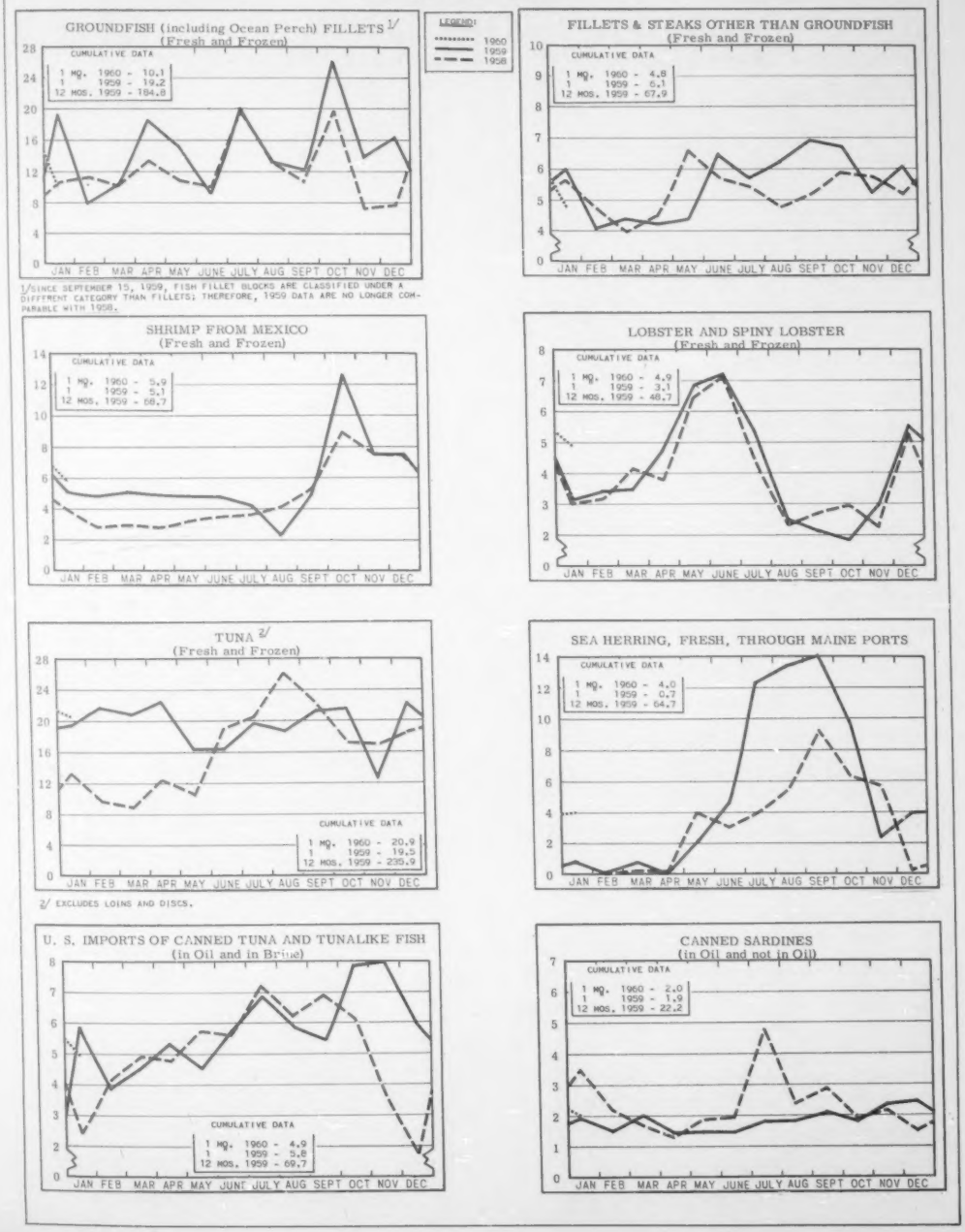
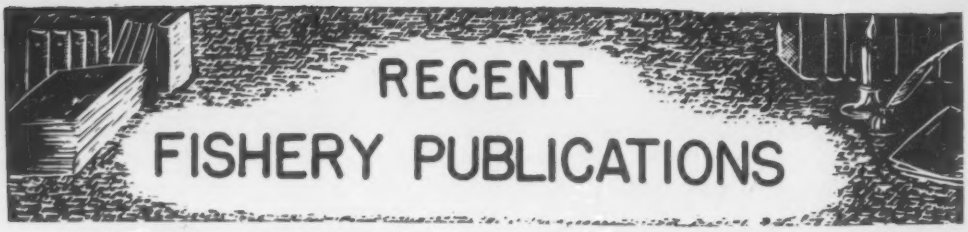


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds


GROUNDFISH (including Ocean Perch) FILLETS 1/
(Fresh and Frozen)
CUMULATIVE DATA
1 MO. 1960 - 10.1
1 1959 - 19.2
12 MOS. 1959 - 184.8
LEGEND:
1960
1959
1958
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
1/SINCE SEPTEMBER 15, 1959, FISH FILLET BLOCKS ARE CLASSIFIED UNDER A DIFFERENT CATEGORY THAN FILLETS; THEREFORE, 1959 DATA ARE NO LONGER COMPARABLE WITH 1958.
FILLETS & STEAKS OTHER THAN GROUNDFISH
(Fresh and Frozen)
CUMULATIVE DATA
1 MO. 1960 - 4.8
1 1959 - 6.1
12 MOS. 1959 - 67.9
SHRIMP FROM MEXICO
(Fresh and Frozen)
CUMULATIVE DATA
1 MO. 1960 - 5.9
1 1959 - 5.1
12 MOS. 1959 - 68.7
LOBSTER AND SPINY LOBSTER
(Fresh and Frozen)
CUMULATIVE DATA
1 MO. 1960 - 4.9
1 1959 - 3.1
12 MOS. 1959 - 48.7
TUNA 2/
(Fresh and Frozen)
CUMULATIVE DATA
1 MO. 1960 - 20.8
1 1959 - 19.5
12 MOS. 1959 - 235.9
2/ EXCLUDES LOINS AND DISCS.
SEA HERRING, FRESH, THROUGH MAINE PORTS
CUMULATIVE DATA
1 MO. 1960 - 4.0
1 1959 - 0.7
12 MOS. 1959 - 64.7
U. S. IMPORTS OF CANNED TUNA AND TUNALIKE FISH
(in Oil and in Brine)
CUMULATIVE DATA
1 MO. 1960 - 4.9
1 1959 - 3.8
12 MOS. 1959 - 69.7
CANNED SARDINES
(in Oil and not in Oil)
CUMULATIVE DATA
1 MO. 1960 - 2.0
1 1959 - 1.9
12 MOS. 1959 - 22.2



FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.
SL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number Title

CFS-2175 - Louisiana Landings, June 1959, 2 pp.
CFS-2179 - Shrimp Landings, August 1959, 6 pp.
CFS-2184 - California Landings, July 1959, 4 pp.
CFS-2192 - Mississippi Landings, October 1959, 2 pp.
CFS-2193 - Fish Meal and Oil, November 1959, 2 pp.
CFS-2208 - Texas Landings, November 1959, 3 pp.
CFS-2211 - Rhode Island Landings, October 1959, 3 pp.
CFS-2213 - Maine Landings, November 1959, 3 pp.
CFS-2214 - New York Landings, November 1959, 4 pp.
CFS-2215 - North Carolina Landings, December 1959, 4 pp.
CFS-2217 - Frozen Fish Report, December 1959, 8 pp.
CFS-2221 - New Jersey Landings, December 1959, 3 pp.
CFS-2224 - New York Landings, December 1959, 4 pp.
CFS-2230 - California Landings, August 1959, 4 pp.
CFS-2231 - Fish Sticks and Portions, 1959 Annual Summary, 3 pp.
CFS-2233 - California Landings, September 1959, 4 pp.

Wholesale Dealers in Fishery Products, 1959 (Revised):
SL-4 - Rhode Island.
SL-5 - Connecticut.

Sep. No. 581 - Processing and Quality Studies of Shrimp Held in Refrigerated Sea Water and Ice: Part 1 - Preliminary Observations on Machine-Peeling Characteristics and Product Quality.

Sep. No. 582 - Braided Synthetic Twines and Their Use in the New England Trawl Fishery.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

California Fishery Products Monthly Summary, December 1959; 14 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish, mackerel, anchovies, and sardines; pack of canned tuna, mackerel, anchovies, and sardines; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; American Tuna Boat Association auction sales; for the month indicated.

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, November 1959, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and wholesale prices for fresh and frozen fishery products; for the month indicated.

Gulf Monthly Landings, Production, and Shipments of Fishery Products, January 1960, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 609-611 Federal Bldg., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; sponge sales; and imports at Port Isabel and Brownsville, Tex., from Mexico; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, January 1960, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

New England Fisheries--Monthly Summary, December 1959, 23 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the principal New England fishery ports, and presents food fish landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith),

and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary for November 1959, 20 pp. (Market News Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, imports entered at NewYork City, primary wholesaler prices for frozen products, and marketing trends; for the month indicated.

Production of Fishery Products in Selected Areas of Alabama, Florida, Louisiana, Mississippi, and Texas, 1958, by Peter DiMarco, 25 pp., processed, December 1959. (Available free from the U. S. Fish and Wildlife Service, 609-611 Federal Bldg., 600 South St., New Orleans, La.) The first part reports on trends and conditions in Gulf Coast fisheries during 1958 and gives a resume of the individual fisheries. For the shrimp fishery, a detailed account is presented of total landings by states, extent of coverage of landings, composition of shrimp landings by species and sizes, prices, canning, imports, cold storage stocks and freezings, general trends and developments, Pacific Coast shrimp developments, new leaflet issued on shrimp gear, and voluntary breaded shrimp standards. Discusses production and market conditions for the oyster and blue crab fisheries, as well as imports of fresh and frozen fish and shellfish. The second part includes shrimp closed seasons in effect in the Gulf States during 1958, minimum shrimp size regulations, conversion factors and container capacities, and shrimp sizes. The second part also contains statistical tables showing total fishery products landings by areas and species, by species and months, by areas and species by months; fishery imports through the New Orleans Customs District and Port Isabel and Brownsville, Tex.; and LCL express shipments from New Orleans for 1958 by months and destination. Also includes tables showing monthly range of wholesale prices of fishery products on the New Orleans French Market; Gulf States weekly oyster and shrimp packs, 1957/58 season and packs by season 1953/58; summary of Gulf shrimp landings for selected areas, 1957-58 and 5-year averages; and fishery products market classifications in the Gulf area.

Production of Fishery Products in Selected Areas of Virginia, Maryland, and North Carolina, 1958, by William N. Kelly, 46 pp., processed. (Available free from the Market News Service, U. S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Reviews commercial landings of fish and shellfish and the production of crab meat and shucked oysters as reported by producers and wholesalers in the specific areas mentioned. Covers production of fishery products by months and by localities, shrimp landings in certain North Carolina localities, and production of certain shellfish in selected areas of Virginia and Maryland. The statistics in this summary represent partial commercial fisheries production only and do not show complete commercial landings or production for a given area, individual state, or the Chesapeake Bay area as a whole. However, the data do give an indication as to the trend in fisheries production for the specific areas designated and do reflect the over-all production trend.

(Seattle) Washington, Oregon, and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, January 1960, 9 pp. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria (Ore.), wholesale dealers; Seattle's otter trawl landings and prices; Northwest Pacific halibut landings; receipts of canned fishery products; and Washington shrimp landings; for the month indicated.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Number	Title
MNL- 7	- Mexican Fisheries, 1958.
MNL- 8	- Portuguese Fishing Industry.
MNL- 9	- Fishery Developments in the Philippines for 1958.
MNL-10	- Swedish Fisheries for 1958.
MNL-11	- Spanish Fish and Shellfish Industry, 1958.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

Take a Can of Salmon, Circular No. 60, 17 pp., illus., printed, 15 cents, 1960. The recipes in this booklet tested in the Bureau's own test kitchens, are calculated to satisfy a wide range of tastes. There are "Salmon Crepes Bayou," which might suit the gourmet hostess planning a small buffet supper; and then there are "Salmonburgers," a tangy snack easily prepared by the busy mother of small children. Most of the recipes are illustrated with beautifully planned color photos. The economy, versatility, and nutritional value of canned salmon are emphasized in the booklet. "If overweight is a problem in your family, you'll be glad to know that equal portions of salmon and lamb chops contain about the same amount of protein but four ounces of salmon contain only 150 calories while four ounces of lamb chops contain 450 calories," suggests the author.

MISCELLANEOUS PUBLICATIONS

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ALGAE:

"Algae as a Source of Human Food," article, Nutrition Reviews, vol. 17, August 1959, pp. 238-240, printed. Nutrition Foundation, Inc., 99 Park Ave., New York 16, N. Y.

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ALGINATES:

"Information and Evaluation of Alginates. I," by Willibald Diemari and Hans Hermann Weichel, article, Deutsche Lebensmittel-Rundschau, vol. 54, 1958, pp. 51-55, 76-79, printed in German. Deutsche Lebensmittel-Rundschau, Wissenschaftliche Verlagsgesellschaft m.b.h., Birkenwaldstrasse 44, Stuttgart N., Germany.

Sodium Alginate as a Blood-Plasma Substitute, by Masanobu Tomoda, Kiyoshi Iguchi, and Eichi Ikeda, Japanese Patent No. 4593. Japanese Patent Office, Tokyo, Japan, June 11, 1958.

AMINO ACIDS:

"Biological Availability of Amino Acids in Fish Meals and Other Protein Sources," by L. E. Ousterhout, C. R. Grau, and B. D. Lundholm, article, Journal of Nutrition, vol. 69, September 1959, pp. 65-73, printed. Journal of Nutrition, The Wistar Institute of Anatomy & Biology, 36th St. at Spruce, Philadelphia 4, Pa.

ANIMAL FEEDING:

"Sources of Unidentified Factors for Practical Poultry Diets. 1--The Value of Fish Meals, Meat Meals, and Fish Solubles for Chicks and Broilers;" "2--The Value of Fish Solubles, Dried Whey, Dried Distillers' Solubles, and Certain Fermentation Products for Chick and Broiler Diets;" and "3--The Value of Fish Solubles, Dried Whey, and Certain Fermentation Products for Turkeys," by J. D. Summers, W. F. Pepper, and S. J. Slinger, articles, Poultry Science, vol. 38, July 1959, pp. 816-825, 846-854, and 922-928, respectively, printed. Poultry Science Association, Kansas State College, Manhattan, Kans.

ANTIBIOTICS:

"The Use of Aureomycin for Fish Preservation under South African Conditions," by D. L. Georgala, Progress Report No. 38, 5 pp., printed. Fishing Industry Research Institute, University of Cape Town, Rondebosch, Union of South Africa, February 1959.

BARENTS SEA:

Promyslovye Ryby Barentseva Moria i Ikh Pitanie (Rukovodstvo Dlia Plavsostava Tralovogo Flota) (Fishes in the Barents Sea), by K. Konstantinov, 47 pp., illus., printed in Russian. Poliarnyi Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khoziaistva i Okeanografii im. N. M. Knipovicha (PINRO), Murmanskoe Knishnoe Izd-vo, U. S. S. R., 1959.

BIOCHEMISTRY:

"On Actomyosin of Squid Muscle from Salt-Extract Preparation of Actomyosin," by Juichiro J. Matsumoto, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 2, 1958, pp. 125-132, printed. Japanese Society of Scientific Fisheries, c/o Tokyo Suisan Daigaku, Shiba-kaigandori 6-Chome, Tokyo, Japan.

"Biochemical Studies on the Growth and Maturation of Fish Organs. III--Vitamin B_{12} Contents of Fish Organs," by Yasuyuki Shimidu, article, Nankai-ku Suisan-kenkyusho Hokoku, vol. 6, 1957, pp. 18-24, printed. Nankai ku Suiken, Kochi, Japan.

"Biochemical Studies on the Growth and Maturation of Fish Organs. VI--The Contents of Iron, Copper, and Zinc in the Ovaries of Yellowfin Tuna," by Shichiro Higasa and Akimi Suzuki, article, Nankai-ku Suisan-kenkyusho Hokoku, vol. 6, 1957, pp. 41-45, printed. Nankai-ku Suiken, Kochi, Japan.

"Determination of Residual Quantities of Chlortetracycline in Fish," by G. B. Dubrova, Yu. A. Ravich-Shcherbo, and A. Ya. Onikienko, article, Voprosy Pitaniya, vol. 17, no. 4, 1958, pp. 53-57, printed. Scientific Research Institute, Mech. Fish Ind., Leningrad, U. S. S. R.

"On the Formation of Amine in Fish Muscle. III--Simple Method for the Detection of Histamine in Fish Muscle," by Fuyuo Ota, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 1, 1958, pp. 37-40, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, c/o Tokyo Suisan Daigaku, Shiba-kaigandori 6-Chome, Tokyo, Japan.

"An Improved Cylinder Plate Assay Method for Determination of Chlortetracycline in Fish Tissues," by Tetuo Tomiyama, Atsushi Tsuda, and Yasuo Yone, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 4, 1958, pp. 289-295, printed. Japanese Society of Scientific Fisheries, Tokyo Suisan Daigaku, Shiba-kaigandori 6-Chome, Tokyo, Japan.

BYPRODUCTS:

"Polarographic Studies on the Smell of Fish and Whale Meal and Oil," by Ikunosuke Okada and others, article, Journal of the Tokyo University of Fisheries, vol. 39, 1953, pp. 177-184, printed. The Tokyo University of Fisheries, Shiba-kaigandori 6, Minato-ku, Tokyo, Japan.

Preservation of Fish and Fish Offal for Oil and Meal Manufacture, by G. A. Carpenter and June Olley, Food Investigation Technical Paper No. 6, 27 pp., illus., printed, 1s.9d. (about 24 U. S. cents). Her Majesty's Stationery Office, York House, Kingsway, London W. C. 2, England, 1958.

Preserving Herring for Flour and Oil Production, by Olav Notevarp, Norwegian Patent No. 92,373. Norwegian Patent Office, Oslo, Norway, September 1, 1958.

CALIFORNIA:

California Fish and Game, vol. 46, no. 1, January 1960, 112 pp., illus., printed. California Dept. of Fish and Game, 722 Capitol Ave., Sacramento 14, Calif. Includes among others, these articles: "A Survey of Fish Transportation Methods and Equipment," by Kenneth S. Norris and others; "The Morro Bay Otter Trawl and Party Boat Fisheries, August 1957 to September 1958," by Richard F. G. Heiman and Daniel J. Miller; "Observations on the Food Habits of Longline Caught Bigeye and Yellowfin

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Tuna From the Tropical Eastern Pacific, 1955-1956," by C. E. Blunt, Jr.; and "Recovery of Tagged Bluefin Tuna (Thunnus saliens)," by Bruce M. Chatwin and Craig J. Orange.

CANADA:
Fisheries Statistics of Canada, 1957 (Canada Summary), vol. 1, part 3-A, 33 pp. (tables), printed in English and French, 75 Canadian cents. Dominion Bureau of Statistics, Ottawa, Canada, January 1960. (For sale by Queen's Printer and Controller of Stationery, Ottawa, Canada.) This report provides a summary of the Canadian fisheries and the information is arranged to show separately the three main fisheries areas--Atlantic, Pacific, and Inland. It includes data on the quantity and value of the catch of selected fishery products for Canada, 1956-57; production of frozen, smoked, salted, and pickled fish, canned fish and shellfish, and fishery byproducts, 1956-57; landings by trawlers, draggers, etc.; capital equipment in the primary fisheries operations; and employment in fish processing establishments. Also contains data on the quantity and value of exports and imports of fishery products; quantity and value of Canada's fishery products and byproducts, by provinces, 1948-57; Canada's canned lobster pack by provinces, 1948-57; salmon pack of British Columbia, by species, 1948-57; and fishing bounties paid to vessels and boats in 1957.

Fishing, a Bulletin for Commercial Fishermen, illus., printed. Fisheries Branch, Province of Manitoba Department of Mines and Natural Resources, Winnipeg, Man., Canada.

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"Fisheries in Netherlands New Guinea Make Steady Progress," by H. van Pel, article, SPC Quarterly Bulletin, vol. 9, no. 4, October 1959, p. 31, illus., printed, single copy 30 U. S. cents. South Pacific Commission, Box 5254, G. P. O., Sydney, Australia. To date, one inland and two sea fisheries stations have been established in Netherlands New Guinea and the first of a number of motor fishing boats has been built and launched. Five different species of fresh-water fish have been introduced and are thriving in Netherlands New Guinea.

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MOTION PICTURES AND RECIPE BOOKLET, IN COLOR, FEATURE CANNED SALMON

Canned salmon can be the basis of good meals and intriguing and entertaining motion-pictures, as shown in a three-unit story of salmon--two 16 mm. 14-minute sound-color films and a recipe booklet in color--recently released by the U. S. Bureau of Commercial Fisheries.

The titles of the films, Salmon - Catch to Can and Take a Can of Salmon, are descriptive of the subject matter. The first begins with the life cycle of the salmon and the three common ways of catching them and ends with getting the salmon into the can. The second "takes a can of salmon" and shows attractive meals as housewives in six typical American cities prepare them.

Salmon Crepes Bayou.

Alaska is the site of filming of most of the first picture. Gillnetting, trolling and purse-seining for salmon are shown in some detail. There are also scenes on salmon biology which should be especially interesting to science classes in grade or high schools. These are followed by several in-plant sequences showing the canning of the product.

In the second film, six typical American cities are visited. Each visit is introduced by some exceptionally good pictures of the better-known landmarks. The cities are San Francisco, Seattle, Miami, Chicago, New Orleans, and New York. A favorite recipe, based upon historical or other characteristics of each city is developed in the film. For example, in San Francisco a can of salmon is utilized in an old Chinese recipe. In Seattle a can of salmon is converted into an attractive outdoor meal. All of the recipes shown in the Take a Can of Salmon film, and many others, are included in the recipe booklet which, incidentally, bears the same name as the film.

The motion pictures are so arranged that they can be used for two 14-minute showings or used in sequence for a 28-minute show. These films, as are most other Bureau films, are cleared for use on television.

The films and the recipe booklet are sponsored by the Canned Salmon Institute, Inc., and produced by the U. S. Bureau of Commercial Fisheries under contract with commercial motion picture producers in New York City. The films will be distributed on a free loan basis through Bureau sources and the Bureau's 170 cooperating film libraries throughout the country.

Applications for loan should be sent to the Visual Education Unit, Bureau of Commercial Fisheries, Post Office Box 128, College Park, Maryland. A catalog of other available fishery educational films may be secured from the College Park film distribution center or from the Fish and Wildlife Service, Washington 25, D. C.

The recipe booklet may be purchased for 15 cents from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. A 25-percent discount will be given on orders of 100 or more copies of this publication sent to one address.